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ABSTRACT

This report presents information regarding the public school's role in United States dentistry. An introductory section provides a brief overview of the status of dentistry in public education. Section II, "The Genesis of School Dentistry in the Progressive Era," discusses new understanding of oral disease, the school health movement and oral disease, and early experimentation in school dentistry. "School Dentistry in the 1920's: Expansion in a Conservative Political Climate" is the topic of the third section, which addresses the expansion of school dentistry during this time period. Section IV discusses "School Dentistry in the Depression Era," covering an incomplete American Dental Association (ADA) survey, the Mountin-Flook Survey, and the Cleveland Child Health Association Study. Section V addresses "School Dentistry and the New Prosperity: 1941-1961," considering dentistry's postwar boom; the 1955 ADA survey; and the Dollar-Sandell Survey of 1959. The final section, entitiled "The Great Amnesia: Whatever Happened to School Dentistry?" discusses the lack of dental health services and education in today's public schooling. (CB)



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# The Public School in American Dentistry

Steven L. Schlossman, JoAnne Brown, Michael Sedlak

with an Afterword by Max H. Schoen

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# The Public School in American Dentistry

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Prepared for the
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# PREFACE

This report forms part of The Rand Corporation's contribution to the National Preventive Dentistry Demonstration Program, sponsored by the Robert Wood Johnson Foundation. It attempts to fill a major void in the dental literature on the origins and development of school-based dental programs prior to the 1970s.

## SUMMARY

Recently, a number of groups have become interested in improving children's oral health through school-based dental programs. Yet these new proponents of school-based programs apparently are unaware that prior to the 1960s the public schools were deeply involved in children's dentistry. Indeed, between about 1915 and 1950, public school programs provided a major portion of children's dental preventive care and treatment. This report provides a preliminary overview of the public schools' role in U.S. dentistry.

Because academic dentistry has made little effort to gather archival data or to foster serious historical scholarship, a comprehensive account of the school's role in dentistry is not presently possible. However, it has been possible to piece together general patterns of development from widely scattered data. The purpose of this report is to inform contemporary policy debate and to stimulate scholarly inquiry into dentistry as an important subject in the history of the health sciences, public health, and public education.

### THE EARLY HISTORY OF SCHOOL DENTISTRY

School-based dentistry was largely the product of the Progressive era's wide-ranging child welfare crusades. In dentistry, the crusade took two approaches beyond the addition of purely educational oral health programs. The first was the establishment of school dental clinics, which provided reparative and restorative services performed entirely by dentists. During the years prior to World War I, at least 69 cities sponsored school dental clinics. The second approach, developed and popularized by Alfred Fones, utilized the services of dental hygienists, who provided preventive care as well as oral health education in the schools.

After World War I, several forces brought many school-based social service innovations, including school medical clinics, under attack. In the conservative Harding and Coolidge years, public service programs were seen as an opening wedge to socialism, and school medical clinics were cut back sharply. These conservative forces might have been expected to undermine school dental programs as well, yet school dentistry prospered during the 1920s as never before. Schoolchildren made up a highly disproportionate share of patients of dental clinics, representing about two-thirds of the total clinic clientele. Half of the

approximately 1.2 million children and youth served were treated at the approximately 460 dental clinic programs run by or through the public schools.

The reasons for the expansion of school dental programs during this time are complex and cannot be definitely established without in-depth, case-study analysis. However, the dental profession's attitude toward the programs and toward children's dentistry in general may have been the key. During the 1920s, American dentistry experienced the first economic boom in its history. For dentists, young and old, the future looked bright enough that the free services schools were providing for children did not seem economically threatening. Further, support for school dentistry made the profession appear to have two qualities that physicians had long criticized it for lacking: a paramount concern for prevention of disease, and a commitment to public service.

However, the attitude toward children as patients may have been one of the strongest contributing factors in dentists' support of school programs. Very few practicing dentists in the early 20th century wanted children in their practices because they were troublesome patients; moreover, parents demanded lower fees for children's care, and they often refused to pay the dentist's bill for that care.

## SCHOOL PROGRAMS DURING THE DEPRESSION

The Depression decimated school social services and brought the final withering of school medical programs. Yet, again, school dentistry flourished. Government at local, state, and federal levels became actively committed to providing basic dental services to those who could not afford them. As times became hard for dentists, the American Dental Association joined organized medicine in denouncing those who called for substantial government intervention to guarantee public health care. However, from organized dentistry's perspective, free school service was no particular threat because children were less likely than ever to show up at private offices in the Depression or to be able to pay for treatment if they did. Moreover, even as incomes fell, most established practitioners still preferred not to have children as patients. Thus, supporting school programs served the same professional interests that it had in the 1920s.

It is impossible to indicate precisely how many more children were served and how much more dental service was available by the end of the Depression than at the beginning. However, three large-scale surveys were conducted between 1936 and 1943 whose results suggest that there were more school dental programs providing operative services by 1943 than there were in 1930.

## SCHOOL DENTISTRY FROM 1941 TO 1961

When young Americans began answering the draft call during World War II, their teeth were in dreadful condition. Dentists enlisted in the services in droves and virtually overhauled the mouths of a generation of men, greatly enhancing professional prestige in the process. In the decade following the war, the private practice of American dentistry flourished as never before, and dentists generally had all the patients they wanted or could serve.

This period also marked a major change in children's care and in the profession's attitude toward school programs. Children of the baby boom were becoming more and more integral to private practice. By the late 1950s, nearly half of the school-age population was visiting a dentist about once a year. Although school programs primarily served children whose parents could not purchase dental services, the very existence of such programs could now reasonably be portrayed as a potential constraint on private practice.

From the early 1950s onward, organized dentistry adopted a condescending stance toward the school programs. It portrayed them as an unfortunate legacy of the Depression, staffed by lesser or inexperienced dentists, and providing inferior, unsystematic care. The profession's position was that parents had primary responsibility for their children's health, and that the only legitimate role for schools was in oral health education. By and large, health educators supported this position, believing that recent discoveries in the psychology of learning had at last made it possible to design effective dental health education programs.

Yet despite the attitudes of dental and educational professionals, school dentistry seems to have remained as firmly entrenched as ever, at least until 1960. Two surveys conducted in the middle and late 1950s indicate that it may have even experienced some expansion. The results of these surveys suggest that school dentistry was a grassroots social service that individual communities considered sufficiently valuable to sustain in the face of professional opposition. And these were not simply educational programs: operative treatment remained central in school dental programs.

## THE DEMISE OF SCHOOL DENTISTRY

The dental profession's shift from support to hostility finally spelled disaster for the school programs. During the 1960s, they folded so rapidly that by the late 1970s, hardly anyone in the profession appeared to remember that school dental clinics had once existed in

the hundreds. It is impossible (without city-by-city analysis) to know the process by which long-established school dental programs collapsed. However, organized dentistry's view of the programs probably persuaded aspiring dentists to avoid the school programs and their taint of "socialized dentistry."

Even among public-health-oriented dentists, the main directions for service delivery during the Great Society era consisted of expanding the number and capacity of dentists to meet rising demand and bringing the unserved poor into private offices (through Medicaid) or into federally supported "neighborhood health centers." In sum, the effort to make dental treatment more widely available in the 1960s and 1970s largely sidestepped the school as a potential vehicle for service delivery.

During that period, organized dentistry also began to support fluoride programs in the schools. By 1980, nearly one-quarter of the nation's schools had fluoride rinse programs, which may have involved 8 million children, a far greater number than the school dentistry programs between 1910 and 1960 ever reached. Probably not since the Progressive era had there been so much optimism about the school as the principal avenue for revolutionizing America's dental health.

Unfortunately, a major demonstration and evaluation of school preventive care (begun around 1975 in 200 schools) made some startling findings that seriously undercut that optimism. First, the incidence of dental caries among students entering school during the late 1970s was so low that the preventive programs had very little to prevent. Second, applying surface sealants, which the study found were far better preventives than fluoride rinses, turned out to be twice as expensive as repairing the few cavities they would prevent. Finally, schools were not as efficient a location for delivering preventive procedures as proponents assumed. They created considerable logistical and implementation problems, and the indirect costs of integrating the programs into the schools' other activities were high.

Nothing in the evaluation precluded the possibility of using schools to deliver extensive treatment services to remaining groups of high-caries, low-income children in urban ghettos and rural areas. However, that possibility is still remote, given organized dentistry's opposition to using schools for restorative treatment, school administrators' concern with educational "basics," and the decline of caries as a significant dental health problem.

## ACKNOWLEDGMENTS

As historians, we were fortunate in receiving enthusiastic cooperation from several distinguished dental scholars. We extend special thanks to Dr. Harry Bohannan of The University of North Carolina for getting us off to a good start and for constructively criticizing earlier drafts of the report. Special thanks are due, too, to Dr. Max Schoen of The University of California, Los Angeles, for serving as a sounding board for the development of our early ideas and for thoughtfully commenting (in the Afterword) on the implications of history for public policy. Archival research was greatly facilitated by the expert library staffs in the schools of dentistry of The University of Pennsylvania, The University of Southern California, and The University of California, Los Angeles. Finally, we thank Dr. Stephen Klein of The Rand Corporation for originally suggesting how history might illuminate the public school's role in dentistry.

We accept full responsibility for any errors of fact or interpretation.

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# I. INTRODUCTION

The significant role that the public school could play in upgrading the oral health of American children and youth has been cited by prominent public health advocates, professional dental organizations, government officials, and foundations in numerous speeches, articles, and reports. These individuals and groups have proposed various means to make schools central to the social organization of dentistry.[1] To be sure, they do not think alike on the subject—their differences generally center on the appropriate balance among education, prevention, and treatment in school-based programs, and they often reveal fundamental divisions based on ideology and perceived economic self-interest. What these groups have in common, though, is a shared sense of having newly discovered the school as the key to upgrading oral health by equalizing access to modern preventive dentistry.

Of course, the dental community has not been alone in seeking to expand the social and health responsibilities of schools. Since the Great Society innovations of the 1960s, innumerable interest groups have envisioned the school as the repository for an endless stream of new services justified in the name of "child welfare" or "community uplift."[2] Nonetheless, the dental community's recent discovery of the schools' key role in preventive dentistry warrants special attention because it has occurred without the recognition that not very long ago, public schools were highly involved in American dentistry, not merely in education but in the delivery of preventive and treatment services as

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[1]See James Dunning, "An International Look at School-Based Children's Dental Services," *American Journal of Public Health*, Vol. 68, July 1978, pp. 664–668; Max Schoen, "Dentist Liberty Versus Patient Equity," address prepared for the Third Annual Dunning Memorial Symposium, April 15, 1983; Reuben Warren (ed.), *School-Based Dental Delivery Systems*, East Longmeadow, Massachusetts: Celecom Corp., 1980; "Do School Dental Programs Affect the Dental Health Status of Children?" Proceedings of a Symposium, *Journal of Public Health Dentistry*, Vol. 39, Fall 1979, pp. 257–297; Institute of Medicine (Division of Health Care Services), *Public Policy Options for Better Dental Health*, Washington, D.C.: National Academy Press, 1980; American Dental Association (Bureau of Dental Health Education), *First National Symposium on Dental Health Education in Schools*, Chicago: American Dental Association, 1975; John Ingle and Patricia Blair (eds.), *International Dental Care Delivery Systems*, Cambridge, Massachusetts: Ballinger Publishing Co., 1978; The Robert Wood Johnson Foundation, *Selected National Initiatives to Improve Health Care: A Decade of Experience*, Princeton, New Jersey: Scanticon, July 28–30, 1982; Philip Nader, *Options for School Health*, Germantown, New York: Aspen Systems Corp., 1978.

[2]See Diane Ravitch, *The Troubled Crusade*, New York: Basic Books, 1983; and Michael Sedlak and Steven Schlossman, "The Public School and Social Services: Reassessing the Progressive Legacy" (forthcoming).

well. In historical perspective, many recent proposals to expand the schools' role in dentistry seem to be merely elaborations or reinventions of programs that were in operation early in the century. Hundreds of school dental programs remained fully operational until the dawn of the Great Society era, but because school dentistry in the 1940s and 1950s received so little attention in the dental or educational press, its earlier existence has been forgotten. It is as if a key component of American dental experience never happened at all.

How could the historical role of public schools in American dentistry have been so casually forgotten? The answer lies partly in studied indifference: The dental profession has tended to view its past largely as a vale of tears, of which it chooses not to be reminded. Unlike the medical profession, academic dentistry had made little effort to gather archival data and foster serious historical scholarship. Moreover, neither historians of medicine nor of public health have been inclined to claim the subject as their own.[3] Another explanation lies in the economic boom that followed World War II. The war itself and postwar prosperity generated new demand for dental services and salvaged dentistry from its Depression-era travails, when poorly paid, part-time practice in school clinics provided a welcome alternative to unemployment. By the 1950s, dentists' prior dependence on the schools had become not only unnecessary but a bad reminder of recent professional degradation. School dentistry came to be viewed as an anachronism that was better politely ignored than vigorously challenged, in the expectation that without professional recognition, it would wither away.

It is presently not possible to provide a comprehensive account of the public school's role in dentistry. Substantial in-depth research in local school board, health department, and dental society archives, as well as sophisticated analysis of the evolution of the dental profession as a whole, would first be essential.[4] Nonetheless, it is possible to

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[3]An exception is John Duffy, *A History of Public Health in New York City: 1866-1966*, New York: Russell Sage Foundation, 1974. Paul Starr's prize-winning *The Social Transformation of American Medicine*, New York: Basic Books, 1982, is typical in devoting less than a sentence to dentistry.

[4]The closest thing to a comprehensive history is Robert McCluggage, *A History of the American Dental Association*, Chicago: American Dental Association, 1959. Three comprehensive studies of related subjects are also relevant: Edith Lindsay, "Origins and Development of the School Health Movement in the United States," Ph.D. dissertation, Stanford University, 1943; Richard Means, *A History of Health Education in the United States*, Philadelphia: Lea and Febiger, 1962; Penny Hamilton, "The Dental Hygienist: The First Half-Century 1913 to 1963," Ph.D. dissertation, University of Nebraska, 1981. A major exception to the above generalizations is the pioneering work of Clifton Dummett on black dentists. See especially C. O. Dummett, *Charles Edwin Bentley: A Model for All Times*, St. Paul: North Central Publishing Co., 1982.

piece together general patterns of development from widely scattered data. What follows should be regarded as a preliminary overview, intended both to inform contemporary policy debate and to stimulate scholarly inquiry into dentistry as an important subject in the history of the health sciences, public health, and public education.

# II. THE GENESIS OF SCHOOL DENTISTRY IN THE PROGRESSIVE ERA

"School-based dental care delivery systems for children are almost unknown in the United States," wrote a distinguished champion of public health dentistry recently. The few that exist, wrote another, are "fragmented, not comprehensive or continuous, and rarely reported in the literature."[1] Such was decidedly not the case in the years between 1900 and World War II, when the potential and actual role of the public school in upgrading the oral health of American children and youth was a regularly discussed subject in dental, educational, and popular literature. Especially in the 1910s, the heyday of the Progressive era,[2] the possibilities of school-based dentistry reached euphoric rhetorical heights never scaled before or since. School dentistry became a centerpiece of the larger child welfare crusades of the period. By combining a missionary devotion to science, cleanliness, popular education, prevention of illness, and conservation of scarce resources, school dentistry epitomized the Progressive reform style and credo.

Recalled Alphonso Irwin, a leading proponent of school-based dental clinics, in 1913:

> In the beginning, school dentistry possessed no status whatever, nay, more, it was regarded with suspicion and distrust, ridicule and contempt, aversion and hostility. . . . Many looked upon it as a visionary idea promulgated by enthusiasts; some educators declared it "too paternal"; if the teeth, why not the eyes, the ears, the nose, the throat—where would this movement end? Others regarded it in the light of an unwarranted intrusion upon domestic functions, and the untutored public believed it to be a clever scheme of providing employment for idle dentists; while friends opined that, at its best, it was an impracticable plan to take care of children's teeth.

Fortunately, Irwin observed, those years of doubt and cynicism were over. School dentistry was already a tested "established beneficence"

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[1]James Dunning, "National and International Models for School-Based Dental Care Delivery Systems," in Warren, op. cit., p. 32; Robert Bagramian, "Combinations of School-Based Primary and Secondary Preventive Dental Programs in the United States and Other Countries," *Journal of Public Health Dentistry*, Vol. 39, Fall 1979, p. 275.

[2]The so-called Progressive era spanned roughly 1890 to 1917 and is the object of innumerable studies in American history. Although dentistry has previously been ignored, there are many analyses of related child welfare reforms. See, for example, Lawrence Cremin, *The Transformation of the School*, New York: Alfred A. Knopf, 1961; Murray Levine and Adeline Levine, *A Social History of Helping Services*, New York: Appleton-Century-Crofts, 1970; Steven Schlossman, *Love and the American Delinquent*, Chicago: University of Chicago Press, 1977.

in nearly 500 clinics in 22 countries. Although the United States was lagging, 69 cities had recently introduced "school dentistry in some phase of development." And momentum for additional clinics, aided by vigorous support from organized dentistry, medicine, education, and especially the popular press, was growing daily. Ultimately, Irwin predicted, dental clinics would "embrace the school population of the world. Then, and not until then, will school clinics fulfill their destined function, which is, to accomplish the hygienic conservation and ultimate salvation of the race."[3]

A rationale for the emergence of American school dentistry had been taking shape for several decades. Two long-term developments, one in scientific research on oral disease, the other in the field of school health, converged around 1910 to lay a base for "revolutionizing public sentiment" on the roles that schools might play in improving children's oral health.[4]

## NEW UNDERSTANDING OF ORAL DISEASE

Well into the 1800s, the ancient worm theory of dental disease (in which very small worms were alleged to eat through the teeth) still enjoyed a wide following among the public and even within isolated segments of the medical and dental professions. While alternative hypotheses abounded, it was not until the end of the 19th century that a scientific consensus began to form concerning the etiology of caries and the relation of oral health to general health. The consensus drew heavily upon the pioneering research of W. D. Miller, an American dentist and physician studying in Germany. In the 1880s, Miller first promulgated the chemico-parasitic theory of dental caries; in the 1890s, he advanced the focal infection theory of how dental disease jeopardized systemic health conditions. The two theories provided the basic intellectual framework for most dental research and practice during the next half-century.

According to the chemico-parasitic theory, decaying food particles mixed with salivary bacteria to produce acids that, when shielded by gelatinous plaques, built up in such concentrations as to gradually destroy the surface and infrastructure of the teeth. The key to prevention, Miller reasoned, lay in keeping the oral environment as free as possible of bacterial plaques under which acid fermentation might occur. It was but a short step from Miller's theory to the invention by

[3]Alphonso Irwin, "The Status of School Dentistry," *Transactions*, Fourth International Congress on School Hygiene, Buffalo, New York, 1913, pp. 349, 352–353.

[4] Ibid., p. 352.

M. L. Rhein of the prophylactic tooth brush—the essential brush design still in use today for cleansing the teeth after meals—and to the coining by J. Leon Williams of the popular early 20th century oral hygiene slogan, "a clean tooth never decays."

In advancing the focal infection theory, Miller went well beyond his previous research. Viewing mouth disease as a classic case of bacteriological pathology, he placed dentistry at the center of all efforts to improve public health. The human mouth, Miller asserted, was a prime, and probably *the* prime, focus or source of bacteriological infections for the entire body. From polio to pneumonia to syphilis, unattended oral disease ravaged young and old, poor and rich alike. The higher prevalence of dental caries among the poor, though, made them more susceptible to the sequelae of oral infection.[5]

Although Miller's theories stirred great interest within organized dentistry, neither the medical profession nor the citizenry at large paid much attention to oral hygiene or focal infection until the distinguished English physician, William Hunter, gave them his unqualified approval in a widely reported speech on "American Dentistry" in 1909.[6] Much irony attends the favorable public response to Hunter's speech, for his was a vicious attack on common dental practice. American dentists were so taken with the mechanical approach to oral health, he declared, that they ignored how their reparative and restorative appliances (crowns, bridges, dentures) often trapped and aggravated "oral sepsis" and thereby facilitated the spread of infection from the teeth and mouth throughout the entire body. Hunter's sweeping condemnation angered a few highly respected American dentists, but most of organized dentistry took his views to heart, joined in the condemnation of scientifically ignorant, mechanical dentistry, and publicized as never before the role of oral hygiene in individual and community health.

Organized dentistry, in short, adopted the strategy that the best defense was a good offense. During the Progressive era (approximately 1890–1917), the dental profession transformed oral hygiene from a good idea to be taught in the dentist's chair to a social cause to be preached to a national audience—especially to children, because of the early onset and irreversibility of the caries process. And where better to locate a captive audience of children, the dentists concluded, than in the schools?

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[5]W. D. Miller, "The Human Mouth as a Focus of Infection," *Dental Cosmos*, Vol. 33, September 1891, pp. 689–713.

[6]See J. A. Salzmann, *Principles and Practice of Public Health Dentistry*, Boston: The Stratford Co., 1937, pp. 65–68.

## THE SCHOOL HEALTH MOVEMENT AND ORAL DISEASE

As it was in dentistry, 1909 was also a year of new beginnings in the field of school health.[7] Before the bacteriological revolution of the 1880s and 1890s demonstrated the pathology of communicable disease and how schools often incubated and spread disease to the larger community, health concerns had been of minimal interest to public school administrators. But by 1910, physicians and nurses had been appointed, first in Boston and New York and then in hundreds of smaller communities, to inspect schoolchildren daily for evidence of contagious disease. Those suspected of disease were excluded from the classroom until they had recovered or could produce a physician's note proving that they had been thoroughly examined and/or were under treatment.

Physicians and nurses who examined urban schoolchildren could not help noticing the frequency of noninfectious ailments that had never received medical attention. Untreated defects of hearing and vision, malnutrition, rickets, serious physical handicaps, and apparent mental retardation and emotional illness were widespread. By far the most common ailment, though, was raging dental caries and other acute oral diseases.[8] As the prevalence of these defects became apparent, school physicians and nurses began to seek a broader mandate for medical intervention into the life of the school and the schoolchild. "It is difficult to place a limit upon the service which medical inspection should perform," wrote social settlement leader and nurse Lillian Wald in 1905. "The state recognizes its responsibility for the development of citizens. To meet this responsibility, the school is its most efficient agency. If for safeguarding the state, mental training is made compulsory, is it not logical to conclude that physical development—the sound body as well as the sound mind—should as far as possible be demanded?"[9]

During the succeeding decade, complete medical examinations of students at regular intervals became common in large urban school systems. Health and school officials alike learned more than ever before how pervasive were untreated physical ailments among American children and youth. The new data sparked many appeals to health departments and school boards to create new, free treatment facilities to aid

[7]While several historical works examine this subject, the best studies remain S. Josephine Baker, *Child Hygiene*, New York: Harper and Brothers, 1925; and Lewis Terman and John Almack, *The Hygiene of the School Child*, New York: Houghton Mifflin Co., 1929.

[8]Baker, *Child Hygiene*, pp. 355–366.

[9]Lillian Wald, "Medical Inspection of Public Schools," *Annals of the American Academy of Political and Social Sciences*, Vol. 25, 1905, pp. 297–298.

students who were obviously not being served in the private medical sector. The data also made possible new types of research on the relationships between students' health and educational achievement. Correlating health information with records of student grade promotion, physicians and educators soon concluded that untreated "defects" largely explained student "retardation," that is, the failure of students to advance in grade, many of them remaining two, three, four, and more years behind their age peers.

In the decade preceding World War I, innumerable studies of this type appeared in books and medical and educational journals. Easily the best-known publication was the 1909 classic, *Laggards in Our Schools*, by Leonard Ayres of the Russell Sage Foundation.[10] Its publication marked the end of one era and the beginning of another in the school health movement: the final legitimation of the health professional's right of entry into the schools, and the emergence of a new alliance between health specialists and educators in assessing the causes of school failure and planning possible remedies. While dental defects were only one among many physical ailments that Ayres and others spotlighted, the near-universality of oral disease among schoolchildren provided organized dentistry with a splendid rationale for making the schools the locus of a nationwide oral hygiene crusade.

## EARLY EXPERIMENTATION IN SCHOOL DENTISTRY: W. D. EBERSOLE AND ALFRED FONES

It was one thing to have the opportunity for bringing oral hygiene to the masses, especially to schoolchildren, but quite another to organize the means. There were few precedents for such an effort in the United States. A number of 19th century dentists had helped design educational programs for public schools and had delivered free dental services in charitable institutions (primarily extraction of ailing teeth and basic instruction on toothbrushing), and in 1908, the New York Children's Aid Society (a private child welfare agency) had attempted to stimulate widespread American interest in school dental clinics by opening three such clinics in their own industrial schools, with about 30 "publicly spirited dentists" providing free services (mainly fillings and extractions). The Society spokesperson observed with regret that "the taxpayers are not yet familiar with the idea," but he predicted that

[10]Leonard Ayres, *Laggards in Our Schools*, New York: The Russell Sage Foundation, 1909.

Americans would soon willingly assume the burden:[11]

> When it is considered how much inconvenience, pain, and ill-health will be saved to the children of these three schools, and compare this happy result with the condition of neglect shown by the teeth of the children of all other schools, the conclusion is irresistible that every public school must at some future day operate a dental clinic, at which children will attend at regular intervals as naturally as they now attend classes in cooking or carpentry.

Isolated precedents notwithstanding, organized dentistry did not make a concerted effort to sell the gospel of oral hygiene to the larger public, or to portray the school as the key agency through which to work a miracle in American dental health until 1909. In that year the National Dental Association appointed W. B. Ebersole to head its Oral Hygiene Committee. Ebersole's first step was to conduct an experiment in school dentistry in his home town, Cleveland. It was essential, Ebersole concluded, to isolate oral disease from the other ailments associated with school failure, in order to determine whether a targeted program of dental education, prophylaxis, and treatment could radically improve students' educational performance.

Unfortunately, Ebersole's experiment was methodologically amateurish, to say the least. Although he gained permission from the Cleveland Board of Education to open dental clinics in four schools, he limited his experiment to the Marion School, the one school whose principal was devoutly committed to the use of schools for such experimental purposes. Located in a "downtown, congested, cosmopolitan and ghetto section," the Marion School was dominated by first- and second-generation immigrant children. From the initial inspection of their teeth, Ebersole selected the 40 students with the very worst mouths. Eventually, he gained the participation of 27 of them for all phases of the brief (14-month) experiment. To do so, however, he had to promise each a five-dollar gold piece—an extraordinary prize at the time. Each child was carefully taught proper methods of toothbrushing and instructed to brush three times daily. Each child was also taught proper "mastication and insalivation" via a "test dinner" which they ate under the supervision of the school nurse. The nurse visited each child at home until she was satisfied that the children understood the prescribed techniques. Finally, each student had elaborate prophylactic, reparative, and restorative work performed in the school dental clinic, and was given an equally elaborate battery of physical, educational, and psychological tests to establish baseline data. Approximately half of the children had been held back at least one year in

[11]Children's Aid Society (New York), *School Dental Clinics*, New York, 1910.

school, and 50 percent of them were two and more years behind their appropriate grade.[12]

The experimenters saw remarkable changes in the children during the course of the year, all of which they laid to mouth hygiene. Sallow, muddy complexions turned bright and clear. "Fragile, delicate, and nervous" children became "sturdy and well." Twelve-year old Gussie Hammerschlak, two years behind her school grade, was a "wild, gross, irritable and nervous girl" before the dental program began. "Her mouth was in such bad condition it was repulsive." Extensive dental repair using cocaine and anesthesia took months of appointments to complete and included 22 fillings in 11 teeth. When her mouth was finally put in a clean and healthy condition, Gussie became "quiet and ladylike," greatly improved in scholarship, behavior, health, and appearance. But the "banner pupil" was Morris Krause, the terror of the school yard. In her understated way, the school principal explained:[13]

> Morris had ideas peculiarly his own as to what a boy's duties and privileges were. These ideas were so much at variance with the conventional standards that difficulties arose, seemingly insurmountable at times. Since working with the class, he has been manly, tractable, and does not even seem to have the temptations that repeatedly assailed him and were almost the means of his downfall. The result obtained for Morris alone was worth all our effort.

The Marion School experiment included one of the first applications of modern psychological tests to correlate mental with physical defects. Administration of the tests was not well supervised, however, and the planned testing of a control group was never implemented. Moreover, the school psychologist ignored the small size of the experimental group and reported results only in percentages. Because a few children scored enormous gains in health status and educational performance (gains which, in retrospect, probably call much of the baseline data into question), the reported results tended to exaggerate the effects of the experimental program. Nonetheless, these tests became the primary basis for organized dentistry's avid claim during the next decade that school dental programs could work educational miracles.

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[12]See Cordelia O'Neill, "Mouth Hygiene: What It Has Done for Us—What It Can Do for You," *Transactions*, Fourth International Congress on School Hygiene, Buffalo, New York, 1913, pp. 206–213; and "Oral Hygiene as It Appeals to Educators," in Harris Wilson (ed.), *A Brief History of Mouth Hygiene in Cleveland*, Cleveland: S. P. Maunt Printing Co., 1929, pp. 69–117; W. B. Ebersole, "History of the Oral Hygiene Campaign as Inaugurated by the Oral Hygiene Committee of the National Dental Association," *Dental Cosmos*, Vol. 53, December 1911, pp. 1386–1393; and *Report of Scientific Experiments Conducted in the Cleveland Public Schools for the Purpose of Ascertaining the Value of Healthy Conditions of the Mouth*, Cleveland: National Mouth Hygiene Association, 1912.

[13]O'Neill, "Oral Hygiene," p. 19; Ebersole, *Report of Scientific Experiments*, pp. 24–25.

With great ceremony, Principal Cordelia O'Neill and Dr. Ebersole presented the findings of the study at the July 26, 1910, meeting of the National Dental Association (NDA). The children were seated on stage. Ebersole described the study's genesis and execution. O'Neill presented the educator's viewpoint. Solemnly she opened the "sealed envelope" containing the results:[14]

> As the mental and physical improvement in each child was announced, the audience cheered and applauded, and when Miss O'Neill stated that the mental improvement of the class as a whole . . . was 97.7 percent plus, the audience simply went wild with enthusiasm, handkerchiefs and hats were in evidence all over the room, and cheering, such as that auditorium probably had never witnessed before.

However shaky their methodological foundations, and despite reservations voiced by a few researchers about the trustworthiness of the study and of Ebersole himself, the results of the Marion School experiment were widely celebrated in the dental, medical, educational, and popular press. Ebersole, who was elected secretary of the new National Mouth Hygiene Association (created to "teach and preach mouth hygiene"), exulted that "when the dental profession fulfilled its true obligation to mankind, it would and should rank with the medical profession in the importance of its science."[15] Dentists might now confidently declare, stated Alphonso Irwin, "Give me the school children and I will lay a foundation for physical perfection, prolong the reign of beauty, add charm to the accents of eloquence, check oral infection, increase personal efficiency, augment the years of usefulness, and banish the fear of a toothless age."[16]

It is impossible to be precise regarding the implementation of school dental clinics in the Progressive era. While the number of cities sponsoring such programs surely expanded beyond Irwin's initial estimate of 69, how many more is uncertain. The clinic model, though, was given a substantial boost in the 1910s by the opening of two large, philanthropically endowed dental clinics for children in Boston and Rochester—the Forsyth Dental Infirmary and the Eastman Dental Dispensary, respectively—and the continuing expansion of school dental clinics in England and Germany. Only careful analysis of individual city experiences, however, will clarify how many school systems ran operative clinics (by themselves or in alliance with health departments or social agencies); how many limited dental services to inspection of

[14]From *Dentists' Record*, cited in Wilson, *A Brief History*, p. 59.

[15]Ibid., p. 60; Ebersole, "History of the Oral Hygiene Campaign," p. 1392.

[16]Irwin, "The Status of School Dentistry," p. 355.

children's teeth with referral to private dentists; how many offered substantial educational programs via the school nurse; and how many limited dental education to instruction by the classroom teacher alone.

While the clinic idea enjoyed considerable popularity in the Progressive era, most advocates of school dentistry recognized its limits as a solution to the rampant oral disease of American schoolchildren—even when, as in the Marion School experiment, the clinic program incorporated a major educational component. Not until Alfred Fones of Bridgeport, Connecticut, developed and popularized the concept of the dental hygienist did an alternative model for combining dental education and service delivery via the schools begin to gain serious attention.

To Fones, the Marion School experiment provided no model at all. The very fact that Ebersole finally limited his experiment to only 27 children from a single school revealed the limits of relying on volunteer dentists to offer comprehensive dental services, and on nurses to teach oral hygiene and supervise children's eating and toothbrushing habits. Neither dentists nor school nurses, Fones concluded, could be expected to carry the burden of a vastly expanded, school-based campaign to preach and teach oral hygiene. If the school was indeed the most effective place in which to inaugurate a revolution in American dental health, new means had to be devised to demonstrate the virtues of mouth cleanliness—means that would neither alienate dentists nor ask unreasonable sacrifices from them, and would not add to the already demanding obligations of school nurses.

In 1913, Fones opened in Bridgeport the nation's first school to train dental hygienists, principally for service in public schools. Their primary purpose would be to prevent dental disease by educating schoolchildren in self-care (primarily brushing) and by providing frequent prophylactic treatments (primarily tooth polishing and scaling). Fones had no patience with those dentists who protested that these minimally trained subspecialists (whom Fones assumed would be women) might enter into direct competition with dentists for patients or, even worse, that they might align with certain dentists to undercut customary fees. The state of children's teeth was so poor that alternatives to the traditional, private, office-bound, exclusively male delivery of all dental services were essential. "Ninety percent of the school children are suffering from defective teeth. This evil must be checked by preventive treatment, viz., the treatment of the surfaces of the teeth of the child, and the only way to accomplish this is by training women to help us."[17]

[17] *Dental Cosmos*, Vol. 54, July 1912, p. 802.

Fones mastered the muckraking oratorical style of the Progressive era, accomplishing in words what well-known social reformers like Lewis Hine and Jacob Riis did through photography. He scrutinized the schoolchild in painful detail, with a mixture of compassion and disgust, and forced his audience to face the educational and public health consequences of widespread dental disease. Only the public schools, he asserted, reached "all the children of all the people," and he predicted that the schools would be the focus of nearly all future preventive public health activity:[18]

> The most conspicuous defect of the child is the unsanitary condition of its mouth. Like a pigpen or garbage drain slowly seeping its poison into the brook, which, flowing into the reservoir, contaminates the water supply of a city, so do the products of abscesses and decayed teeth with decomposing food slowly but surely poison the human system. Such mouths breed disease. Such children laugh and sneeze millions of germs made virulent and active in an ideal feeding ground . . . around and between the teeth. Why examine this child any further? Here at the gateway of the system is a source of infection and poison that would contaminate every mouthful of food taken into his body. With decomposition, instead of digestion taking place in the alimentary tract, it is no wonder that the child suffers from an auto-intoxication which promises eyestrain, anemia, malaise, constipation, headaches, fevers, and many other ailments.

Effectively using his position as a school board member to further his cause, Fones persuaded the Bridgeport Board of Education in 1914 to hire ten of his first graduates to daily inspect and prophylactically treat the teeth, and to instruct the entire first- and second-grade student body in methods of self-care. No preliminary repair work (such as had been done at the Marion School) was done on the students' teeth, Fones emphasized, just prophylaxis and education, for the object was "to prove the value of prevention and education in mouth hygiene for great numbers of children in preference to exterior repair clinics, with no effort to eliminate the source of the trouble." Moreover, he asserted, every child received the same treatment, regardless of the financial status of the parents. "Some parents objected, thinking the work was a charity, but with a better understanding of it, the objections were soon withdrawn."[19]

Unlike Ebersole, who presented his findings after only 14 months, Fones waited five years to assess the impact of his dental program on children's health and school performance. In addition to tracking a

[18]Albert Fones, "Report of Five Years of Mouth Hygiene in the Public Schools of Bridgeport, Connecticut," *Dental Cosmos*, Vol. 61, July 1919, p. 608.

[19]Ibid., pp. 610–611.

much larger number of students, he also employed a control group—children who were in the fifth grade at the time the new preventive procedures and educational program were initially introduced to first-graders. As in the Cleveland experiment, though, the results were spectacular. Only one-third as many dental caries occurred in the permanent teeth of the experimental group (new fifth-graders) as had existed among the fifth-graders in 1915, when the experiment began. Moreover, school retardation—measured as the percentage of children more than two years behind their age peers in grade (a somewhat more stringent measure than Ebersole had employed in Cleveland)—declined a stunning 50 percent. Fones also observed significant declines in the incidence of diphtheria, measles, and scarlet fever; in addition, Bridgeport had one of the best records in the nation in containing the great influenza epidemic following World War I. "How much of the communicable diseases that gain ingress through the mouth will finally be eliminated from child life in our public school system by an enforced system of mouth hygiene is still a question," he granted, "but all evidence seems to show that a clean mouth with sound teeth is the one most important factor for prevention."[20]

Fones' belief in oral hygiene knew few bounds, as indicated by the following humorous anecdote circulated in Bridgeport:[21]

> So firmly were the principles of oral cleanliness impressed upon some young minds that when a preacher at a certain church visited the children's room and asked for verses from the Bible, one little girl, with the confidence that comes from assured knowledge, rose and in her clear treble repeated, "A clean tooth never decays."

Fones' experiment in Bridgeport created a model at once more and less radical than the dental clinic in its use of the school to advance dental public health. On the one hand, Fones did not propose introducing extensive dental treatments into schools in special clinics designed for that purpose. Given the extent of dental caries in the population, even in the elementary school population, he saw no way to finance or provide enough dentists to complete the needed reparative work. From his perspective, moreover, dentists ought not to play a major role in the schools. Their orientation was toward the treatment of illness, not the prevention of disease. On the other hand, Fones did propose the introduction of a new actor into the school, the dental hygienist, who combined some of the features of the regular classroom teacher and some features of the dentist. The hygienist would teach

[20]Ibid., p. 615.

[21]Mable McCarthy, "Dr. Alfred C. Fones, The Father of Dental Hygiene," *Journal of the American Dental Hygienists Association*, Vol. 13, January 1939, p. 26.

the basics of health instruction while also providing preventive treatments that would otherwise be offered only in a dentist's private office, if at all. Unlike the dentist in a school clinic, the hygienist would not be confined to an office or to a narrowly defined role; she would see children as both students and patients, in both classroom and clinic settings. Fones' dental hygienist was thus to play an unusually free and fluid role within the school setting. She transcended traditional role distinctions between educator and health practitioner. She thereby presented a role threat to the highly insecure yet aspiring professions of both teaching and dentistry in the early 20th century.

## CONCLUSION

The Progressive era gave rise to two distinct but overlapping approaches to incorporating dentistry into the public school system, beyond the addition of purely educational programs. One centered on reparative and restorative services, the other on preventive, prophylactic treatments; one centered on the male dentist, the other on the female hygienist. The extent to which either or both models would be integrated into school social services remained far from clear as the reform spirit of the Progressive era was eclipsed by World War I and its aftermath.

# III. SCHOOL DENTISTRY IN THE 1920s: EXPANSION IN A CONSERVATIVE POLITICAL CLIMATE

The serious decline in school dentistry in the 1920s was predictable, for several good historical reasons. Following World War I, the Progressive reform spirit, which had emphasized the key role government (especially local government) should play in upgrading the health of children and youth and in eliminating handicaps that interfered with their educational progress, met significant challenge. When the Progressive ethos gave way to the postwar "Red scare" and the conservatism of the Harding and Coolidge era, many school-based social service innovations were attacked as opening wedges to socialism. School medical clinics, which had flourished in hundreds of schools during the Progressive era, were among the casualties of this propaganda and were sharply cut back during the 1920s.

The decline of school medical clinics was also precipitated by a vigorous assault that the American Medical Association (AMA) launched in the 1920s against "state medicine" in all its alleged guises. This attack represented a sharp reversal of prior AMA policy.[1] During the Progressive period, the AMA had supported school-based medical clinics as part of its larger commitment to expand government responsibility for public health. The organization had even endorsed rudimentary proposals for national health insurance. In the 1920s, however, the AMA's stance changed abruptly. It became a staunch upholder of an antigovernmental, laissez-faire philosophy regarding the public role in health care. The AMA would tolerate no new approach to the social organization of medicine that threatened the sanctity of fee-for-service medicine delivered by independent family physicians. Moreover, the group became openly antagonistic toward traditional domains of government involvement in public health. It is not surprising that the AMA's well-funded, well-orchestrated campaign against "state medicine," combined with its growing indifference to public health, undermined school dentistry as well as school medical programs in the 1920s.

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[1]See James Burrow, *Organized Medicine in the Progressive Era*, Baltimore: The Johns Hopkins University Press, 1977; John Duffy, "The American Medical Profession and Public Health: From Support to Ambivalence," *Bulletin of the History of Medicine*, Vol. 53, Spring 1979, pp. 1–22; Starr, *The Social Transformation*, pp. 90 *passim*.

The AMA policies undercut school dentistry in yet another way. In 1911, during the heyday of the school health movement, the AMA had joined with the National Education Association (NEA) to form a Joint Committee to guide the development of school health policies and to plan accurate, up-to-date, and pedagogically effective health education programs. The Joint Committee's mission was then seen as fully consistent with, and complementary to, medical service programs in the schools.

During the Progressive era, the Joint Committee accomplished little and maintained a low profile. But in the 1920s, under the leadership of physician and educator Thomas Dennison Wood of Columbia's Teachers College, the Joint Committee became an aggressive, driving force in developing new health education policies and programs. Consistent with the new AMA attitudes, the Joint Committee proclaimed health education rather than health service to be the most appropriate role for schools to play in guarding children's health. New pedagogical means were now alleged to be at hand that would overturn the poor reputation that health instruction in the schools had previously earned. Rather than conveying arid information on the structure of the human body and moralistic principles of self-regulation (aimed particularly at alcohol consumption and masturbation), the Joint Committee developed new curricula that stressed not abstract principles but concrete health habits for children to learn, via stories, rhymes, songs, and plays that featured such imaginary characters as Cho Cho the Health Clown and the Health Fairy.

The Joint Committee's efforts were reinforced by the work of the American Child Health Association and numerous state and local medical and dental organizations. The Oral Hygiene Committee of Greater New York, for example, created the classic pedagogical tract, *The Demon Diggers,* to teach oral hygiene via such imaginary characters as Sammy Sickly and Jack Goodhealth of Mouthland. Together, the various medical and dental organizations helped generate tremendous faith within educational and medical circles in avante garde pedagogy as an effective means to improve students' health.[2]

Several trends within the dental profession itself might well have led early enthusiasts of school dentistry to question the wisdom of

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[2]Means, *A History of Health Education,* pp. 91 *passim;* Thomas Wood and Hugh Rowell, *Health Supervision and Medical Inspection of Schools,* Philadelphia: W. B. Saunders Co., 1927; Joint Committee on Health Problems in Education, *Health Education,* New York, 1930; National Tuberculosis Association, *Fifteen Years of Child Health Education,* New York: National Tuberculosis Association, 1932; Philip Van Ingen, "The Story of the American Child Health Association," *Child Health Bulletin,* Vol. 11, September-November 1935, pp. 149–192; Oral Hygiene Committee of Greater New York, *The Demon Diggers,* New York: Klebold Press, 1924.

maintaining service programs. For one, new scientific research endangered the intellectual rationale for American school dentistry. By the 1920s, sophisticated epidemiological studies had made it increasingly clear that dental caries was pervasive among preschool children; indeed, the caries process was already well under way in most segments of the population by age two. It was also becoming clear that keeping the deciduous teeth healthy and in place was critical to the proper structural alignment of the permanent teeth. Since school dental service had always been justified largely on the grounds that it would teach students the value of early preventive and corrective treatment *before* dental disease did serious damage, the new epidemiological knowledge cast the rationale for the entire enterprise in doubt.

Another set of scientific findings might also have been predicted to prove troublesome for the future of school dentistry. Both of W. D. Miller's key contributions regarding the dental disease process—the chemico-parasitic theory and the focal infection theory (as popularized by William Hunter)—came under challenge from a new generation of researchers in the 1920s. In part, the challenge was simply an effort by scientists to tame the excesses of the early oral hygiene crusaders who had sold mouth cleanliness as a moral and spiritual virtue, and who had portrayed oral disease as the sole source of virtually all serious systemic disorders. These popularizing excesses had caused professional dentistry some embarrassment, particularly in medical circles, and had encouraged the often grotesque commercialization of dentifrices and mouthrinses by manufacturers avidly seeking scientific endorsement of their wares.

But the researchers' challenge to accepted scientific wisdom went deeper. Led by Percy Howe of the Forsyth Infirmary, the new research viewpoint cast considerable doubt on whether mouth cleansing had anything significant to do with the onset and prevention of dental caries. In place of the chemico-parasitic theory, Howe and his colleagues advanced a nutritional theory that declared diet, not oral hygiene techniques, to be the critical variable in explaining caries formation and prevention.[3] In retrospect, it is clear that Miller's theory was able to withstand the challenge of the nutritionists. But in the 1920s and 1930s, the scientific community was seriously divided over the virtues of these two fundamentally different explanations of dental disease. While only a few of the most dogmatic nutritionists dared to declare oral hygiene a waste of time, most of them presented their research as far more scientifically sophisticated than that of their

[3]Rollo Brown, *Dr. Howe and the Forsyth Infirmary*, Cambridge, Massachusetts: Harvard University Press, 1952.

opponents, further eroding the intellectual consensus on which school dental programs were based.

In view of these developments, it is not surprising that spokespersons for public health dentistry today, like their counterparts in medicine, tend to view the 1920s as a retrogressive era.[4] The problem with this interpretation—at least as it pertains to school dentistry—is that the period does not appear in fact to have been retrogressive at all. To be sure, the fastest-growing component of school dental programs in the 1920s was the narrowly educational approach favored by the AMA/NEA Joint Committee. But the triumph of the pedagogues did not signal the end of school-based clinic service. In fact, school dentistry in all its phases—educational, preventive, and corrective—prospered as never before during this period.[5]

## THE EXPANSION OF SCHOOL DENTISTRY

School dental clinics stood at the forefront of the dramatic expansion of clinic dentistry between 1915 and 1930. The number of dental clinics operated by hospitals, health centers, private industries, public schools, and many other types of social agencies began to increase notably around 1915; by 1930 there were around 3,000 dental clinics. Precisely how many of these were school clinics is difficult to say. Few systematic efforts were made to count them; those that were made were primarily grassroots efforts that received no publicity beyond their local townships. Many studies did not last long; and the elaborate, multiple-chair school clinics of the largest cities were usually counted as single facilities and were given the same weight as the small, part-time clinics that were common in small towns.

These difficulties in estimation notwithstanding, several points seem clear.[6] First, schoolchildren comprised a highly disproportionate share of the people served by dental clinics of all kinds. The approximately 1.2 million children and youth treated in clinics represented about two-thirds of the total clinic clientele. Of these children, approx-

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[4]See James Dunning, *Principles of Dental Public Health*, 3d ed., Cambridge, Massachusetts: Harvard University Press, 1979, pp. 47–48.

[5]It must be remembered that relative to the totality of children's dental needs, school dentistry's contributions were modest. However, relative to the totality of dental services received by children in the early 20th century, school dental programs contributed far more than has previously been acknowledged.

[6]The data reported in the next several paragraphs derive from Miriam Leuck, *A Study of Dental Clinics in the United States: 1930*, Chicago: University of Chicago Press, 1932; and *A Further Study of Dental Clinics in the United States*, Chicago: University of Chicago Press, 1932.

imately half were served by clinic programs run by or through the public schools—approximately 460 school dental clinics in all. School dental clinics were most prominent in the Northeast and least prominent in the South. While big cities contained the largest number of chairs and children served in school dental clinics, the great majority of school clinics were located in small cities. This discrepancy derives in part from the fact that the multiple-chair school clinics common in larger cities were usually each counted as a single clinic. School dental clinics were aptly called "undoubtedly the most widespread" of all dental clinics in America as of 1930.[7]

Some basic characteristics of school dental clinics can be identified from a survey conducted by Miriam Leuck and the American Dental Association (ADA) of 178 clinics for which the most reliable data were available. These clinics served nearly one-half million children and youth. The great majority of them were directed by local Boards of Education and/or Boards of Health. Boards of Education were more often in control in cities under 100,000, whereas Boards of Health were more often in control in larger cities. Although local dental societies did not own any of the school clinics surveyed, they often participated formally in establishing policy and were consulted informally on a regular basis. Approximately two-thirds of the school clinics were supported entirely by taxes; about half of the remainder were supported by a combination of taxes and token fees for service. Fees were more popular in cities over 100,000, but were, as a rule, not nearly large enough to defray the costs of services. They were instituted for the presumed moral benefit of the patient, or to dissuade parents from viewing the service as a charity.

While few clinics charged fees, most did regulate rather strictly the people who were eligible to use their services. Clinic access was restricted to students actively enrolled in the sponsor school district, and there were often additional limitations related to student age or grade and economic status. Approximately 90 percent of the clinics confined service to children below specified ages, generally to those in the elementary grades. Approximately 70 percent of the clinics limited access to indigent children only. Thorough investigation of a would-be patient by a social worker or a nurse, however, appears to have been the exception rather than the rule. Scattered commentary suggests that school clinic service was usually rendered on-the-spot to children in obvious pain or other apparent dental need, without elaborate investigation of their parents' economic status. Thus, while the general intent of the restrictions was to limit access to the genuinely poor, a

[7]Leuck, *A Further Study*, p. 106.

significant portion (approximately 30 percent) of clinics did not so restrict their service, and an indeterminate additional portion of those with restrictions did not enforce them.

School clinics generally did not provide a complete array of operative treatments. However, they were rarely limited to screening and referral services. Examinations were nearly universal, as was the provision of a formal prophylaxis, by either a dentist or a hygienist. Thus the oral hygiene crusade of the Progressive era, particularly as it was elaborated by Alfred Fones, greatly influenced school dental clinic services in the 1920s. Extractions were performed slightly less often than prophylaxes. Fillings (amalgam and cement) were provided in approximately three-quarters of the clinics, and additional operative procedures, notably diverse treatments, synthetic fillings, and care of Vincent's infection (trench mouth), were also provided at half of the clinics. Interestingly, the clinics that charged no fees at all—disproportionately those in the largest cities—also performed the widest range of services.

School dental services were provided by a combination of personnel, primarily dentists, dental hygienists, dental assistants, and school nurses. The role of auxiliaries was also notable: School dental clinics (unlike all other dental clinics) used auxiliaries more than dentists to provide services (i.e., auxiliaries put in a larger number of total work hours). While the school nurses working in school dental clinics outnumbered the dental assistants or hygienists, the hygienists put in by far the most hours. The hygienists were generally the only full-time workers. Almost no auxiliaries donated their services.

Dentists in school clinics were employed on very different bases. Only one-tenth were employed full-time. Whether part-time or full-time, the overwhelming majority were salaried. Only 13 percent donated their services (as contrasted, for example, with over 70 percent of the dentists in hospital dental clinics). The fee system of paying dentists according to specific work performed received almost no support. Most dentists who chose school dental clinic service did so soon after graduation. Their positions remained stable; the average length of employment at their current clinic position in 1930 was nearly six years. As the great majority of school dentists were part-time, their long-term commitment to school clinics apparently did not conflict with the development of their private practices.

Most school dental clinics were located in school buildings and had permanent locations with fixed dental equipment. Approximately one-quarter of the clinics, though, were located in a central headquarters, often (but not necessarily) off school grounds, to which children from all schools came for services. In perhaps one-fifth of the clinics,

portable equipment was used either alone or to supplement the work done in the permanent facility.

While the treatments offered by school dental clinics were fairly extensive, it is important to recognize that the official rationale for school service carried an explicitly educational purpose, namely, to teach children good dental health habits. Dental clinic personnel generally spearheaded classroom education programs in the schools and school systems they served. While the dental hygienist and school nurse often gave classroom talks, the instruction was more frequently provided by the dentist or regular teacher. There were simply too few hygienists to carry the educational load and, as we have seen, they were heavily engaged in providing prophylactic treatments in clinics. Literature produced by local dental societies and national organizations was regularly distributed to children and their parents, and approximately half of the clinics sponsored dental health weeks, required teachers to inspect their students' teeth daily as a prod to their instructional efforts, and held regular competitions among classes for the unit with the best proportion of healthy mouths.

By and large, dentists' attitudes toward school dental clinics in the 1920s appear to have been favorable, although, as Leuck observed, professional opinion was most notable for "the lack of any definitely organized sentiment, general throughout the country, on the matter."[8] This contrasted sharply with dentists' views on industrial dental clinics, which they viewed antagonistically as a threat to private practice. While dentists were less enthusiastic about school clinics that charged fees, provided orthodontic and prosthetic services, or had the stated purpose of providing service at reduced prices rather than at no charge to indigents, school dental clinics were simply not hotbeds of controversy in the 1920s (in contrast to school medical clinics, which came under vigorous challenge by organized medicine at both local and national levels during the same period).

Nor did the dominant role of dental auxiliaries in school dental clinics meet significant opposition. To be sure, some state dental societies tried to restrict the range of services that hygienists could provide and to expand the extent of supervision dentists had to exercise over them. As one scholar observed, "There is widespread fear among dentists that dental hygienists will be inclined to violate their obligations and independently extend their practice beyond the statutory confines."[9] Still, there were too few hygienists to excite much concern, and

[8]Ibid., p. 108.

[9]William Gies, *Dental Education in the United States and Canada*, Boston: Merrymount Press, 1926, p. 79.

prophylactic service was regarded as the crux of preventive dentistry and essential for teaching children oral hygiene techniques to use at home. At least through the 1920s, it appeared that the hygienist would make her most substantial contribution to preventive dentistry not in private practice but, as Fones had envisioned her, in the public schools.

In sum, school dentistry did not die or suffer severe cutbacks in the post-World War I era; it expanded significantly, reaching most of the nation's largest cities and hundreds of smaller communities as well. Of course, some other educational innovations of the Progressive era, like vocational training and physical education, progressed far more rapidly in the 1920s than did school dentistry. Nonetheless, the school dentistry advances were notable. There was indeed a special "spirit behind these ventures," as Leuck observed, as "isolated little communities, all over the country, on western prairies or in the mountains . . . established school dental clinics at the cost of great effort, because they looked upon the work as a part of their responsibility to their children."[10]

## WHY EXPANSION?

In retrospect, school dentistry appears to have posed a triple threat to the private practice ideal of medical service delivery: it was controlled mainly by educational agencies; it was tax-supported; and it offered free service to a significant number of nonindigents. Why, then, did it exert so much appeal to local school boards and run into so little overt opposition from organized dentistry? Without fine-grained, case-study analysis, it is not possible to determine precise reasons and to identify variations in local advocacy and implementation experience. Nevertheless, there are a number of plausible general explanations for the overall trend.

1. School dentistry in the 1920s benefited from the success of the Progressive era oral hygiene campaign in raising public concern about children's oral health. The oral hygiene movement stimulated great interest because it appealed to five deeply held tenets of middle-class ideology: that science is the basis of rational social change; that education is the means to spread the wisdom of science and make social change secure; that prevention is the most economical path to reform; that conservation of scarce resources (human as well as natural) is a sacred societal obligation; and that cleanliness, or hygiene, is a key to happiness in both individual and societal affairs (e.g., clean

[10]Leuck, *A Further Study*, pp. 109–110.

government, mental hygiene, muckraking). School dental programs, in short, built upon and institutionalized some of the most important elements in early 20th century social thought.

2. In addition, and somewhat independently, the 1920s experienced a revolution of rising expectations regarding individual oral health and cosmetic appearance. Data on dental self-care and private sector service utilization are imprecise, but it is apparent that Americans in the 1920s were paying more attention than ever before to keeping their mouths clean and healthy, and that they were turning to dentists far more frequently to help them do so. These trends were particularly evident among the middle classes. In the age of Gatsby, concern for oral health became integral to middle-class sensitivity to the need to cultivate beauty and public image in order to get ahead and be socially accepted. This concern was fed by an explosion of advertising in techniques of self-grooming, cosmetics, and, not least, oral hygiene. The 1920s were the heyday of commercialization of dental products. Dentifrice and mouthwash manufacturers made all varieties of patently false claims to holding the secret to perfect oral health. Organized dentistry occasionally protested the dubious promises made for such popular oral health aids as Pepsodent and Listerine, but sales of these and similar products grew substantially nonetheless. Thus, the progress of school dentistry in the 1920s can be viewed largely as a reflection of heightened public consciousness of the importance of good grooming as a strategy of self-advancement.

3. World War I also heightened public interest in the dental needs of America's schoolchildren. In the United States, as had occurred in Britain earlier, the military draft of 1917 revealed more pervasive and more serious dental disease among the country's youth than had ever been documented. Dental defects were the single most important cause of rejection of draftees and enlistees for military service.[11] Even those accepted often had miserable, potentially debilitating dental disorders. The armed forces had to garner massive volunteer support from the civilian dental profession (services which organized dentistry strongly promoted as acts of patriotism) to repair the teeth of thousands of inductees whose efficiency would otherwise have been seriously impaired by mouth ailments. Not only did the wartime experience reveal the seriousness of dental disease for an individual's overall physical well-being, it also exposed several hundred thousand soldiers to regular dental care for the first time. This lesson was probably not lost on these young men after they returned to civilian employment and

[11]William Davis, "Dentistry and the Public Health Movement," in Walter Pelton and Jacob Wisan, *Dentistry in Public Health*, Philadelphia: W. E. Saunders Co., 1949, p. 20.

began to raise families. In short, World War I did much to boost dentistry as a critical health service, to enhance the image of dentists as health professionals, and to open the eyes of many Americans to the benefits of dental care.

4. The first economic boom in the history of American dentistry occurred in the 1920s. Professional journals turned their attention to issues of dental economics and efficient management; the incomes of ambitious dentists reached far beyond heights previously thought unattainable. The boom mentality was reinforced by the successful political campaign led by organized dentistry to ostracize and eventually eliminate many of the commercial, profit-oriented schools of dentistry that had first appeared in the 1890s.[12] These victories enhanced dentists' economic position by significantly reducing competition from new practitioners at a time of rising public demand for dental services.

For dentists young and old, the future looked bright indeed—bright enough that the free services that schools were providing seemed less a threat to private practice than an opportunity to solidify dentistry's professional position. School dentistry, it was hoped, would do this in two ways: first, by creating future demand for dentists' services (and at the same time circumventing professional prohibitions on advertising) by acquainting those children least likely to purchase dental services with the advantages of preventive and corrective treatment; and, second, by giving dentistry the opportunity to demonstrate a magnanimous willingness to risk personal gain for the public good and thereby establish "social credit" as a profession.[13]

This latter concern was no trifling matter for the leaders of the profession. Organized dentistry had long chafed under the physicians' criticism that it lacked two qualities identified with all professions, but especially with the health professions: a paramount concern for the prevention of disease, and a commitment to nonremunerative public service, such as that represented by physicians' regular free services to indigent patients both in their private offices and in hospitals. Organized dentistry's support of the oral hygiene campaign provided evidence of its new sensitivity to prevention as a primary goal of the profession. The proliferation of school dental clinics, with support from organized dentistry, showed that dentists, like physicians (although the dentists, unlike the physicians, were paid), were ready to relieve unnecessary suffering among the most dentally vulnerable segment of the population. In the 1920s, the public school became to dentistry

[12]See Gies, *Dental Education in the United States and Canada*.

[13]On the establishment of "social credit" as a key attribute of aspiring professions, see Magali Larson, *The Rise of Professionalism*, Berkeley: University of California Press, 1977.

what the hospital had long been to medicine—a place to demonstrate charitable spirit and professional obligation and thereby establish "social credit."

The progress of school dentistry in the early 20th century was thus integral to organized dentistry's desire to sell itself—both to the public at large and to organized medicine—as a true *health* profession, inferior to none. While school clinics doubtless benefited children, they also helped satisfy organized dentistry's needs as an aspiring profession. The readiness of organized dentistry, unlike organized medicine, to support expansion of preventive and treatment services in the schools in the 1920s may thus be interpreted as reflecting its mutually reinforcing desires for greater visibility before the public and higher professional status vis-à-vis physicians.

5. While these various factors provide a rich intellectual context for understanding the growth of school dentistry, one additional factor may explain more than all of the others combined. For all the publicity that organized dentistry gave to the preventive ethos and to the importance of providing incremental care to children beginning at very young ages, the fact was that very few practicing dentists in the early 20th century wanted to have children as patients. Children were troublesome dental patients: their mouths were small, they could not sit still, their parents interfered, and, when treatment was completed, they often would not pay the dentist's bill. The problem was not new: In 1878, one dentist had observed, "Notwithstanding all the labor, anxiety, trouble and difficulty we have in operating for the little patients, we find that the bills are reluctantly met and . . . considered as so much money thrown away."[14] In 1921, a Canton, Ohio, dentist attributed dentists' aversion to children's dentistry to "its difficulty and the traditionally lower fees."[15] A later researcher observed that dentists still had no incentive to specialize in children's dentistry because "the public as yet does not recognize the importance of dental care for children and is not prepared to pay for these services at the rates that prevail for adults."[16] Dentists themselves were often more frank: "Proper fees for the extra nervous strain cannot be obtained." "Adults build—children do not add to one's prestige." "Crying hurts business." Children "frighten older patients by fearful screams and groans." Some

[14]D. Klump, "Care of Children's Teeth," cited in Malvin Ring, "Changing Philosophies in Children's Dentistry," *New York Journal of Dentistry*, Vol. 42, June-July 1972, p. 178.

[15]Harter March, "Canton Clinics," *Oral Hygiene*, Vol. 11, 1921, p. 181.

[16]Dorothy Beck, "A Preliminary Summary of the Facts Pertaining to Dentistry Contained in the Published Reports of the Committee on the Costs of Medical Care," *Journal of the American Dental Association*, Vol. 19, February 1932, p. 236.

admitted, "Crying upsets me." Others had a practical solution: "I give them $N_2O$ and the fight is soon over." A few dentists did not mind children but objected to parents. Parents imposed their own fears—formed years earlier when dental treatment had been more painful—upon their children. One dentist noted dryly, "Mother misinforms child before the visit. Orphans make the best patients." Other dentists did not object to serving children because they relegated the service to a "lady dentist," a "female assistant dentist," or a wife or female relative who was also a dentist.[17]

From this perspective, it can be argued that the growth of school dentistry in the 1920s helped dentists satisfy their professional obligation to serve children without disrupting or endangering the growth of more remunerative adult private practice. That women auxiliaries devoted more hours to school service than did dentists themselves made it all the easier for dentists to accept school service as posing no serious threat to traditional male prerogatives. Women auxiliaries carried the brunt of the burden in the 1920s for raising the profession's "social credit" by demonstrating its commitment to both prevention and service to children.

## CONCLUSION

School dental service and women dental auxiliaries helped the profession avoid the embarrassment and resolve the contradiction of strongly advocating preventive dentistry for children at a time when the mass of practitioners saw little practical reason to do so. From the profession's point of view, school dentistry in the 1920s made very good sense indeed.

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[17]Maurice Leven, *The Practice of Dentistry and the Incomes of Dentists in Twenty States: 1930*, Chicago: University of Chicago Press, 1932, pp. 20–22.

# IV. SCHOOL DENTISTRY IN THE DEPRESSION ERA

The Depression decimated school social services, at least temporarily. Even those extracurricular inventions of the Progressive era that had seemed most firmly rooted in the schools of the 1920s—in particular, physical education—came under harsh scrutiny by school boards and were severely cut back or discontinued altogether. What little remained of school medical service withered away almost entirely. The Depression fostered and sanctioned with a vengeance a back-to-basics educational philosophy.[1]

It is especially notable, then, that school dentistry flourished as never before during the 1930s.[2] Indeed, the Depression era stands out, in the words of a distinguished dental scholar, as the dawn of "the modern era in dental public health."[3] Government at local, state, and federal levels became actively committed to providing basic dental services to those who could not afford them—whether they had purchased them in better times or not. The expansion of school dentistry formed part of this larger investment by government in equalizing opportunity for oral health during catastrophic economic times.

What some dentists today view as the flowering of the public health perspective, others view as the nadir of the profession's development as an independent medical specialty. The private dental sector, after riding the crest of public enthusiasm in the 1920s and experiencing substantial advances in status and financial reward, was badly undone by the Depression. The public may have been newly sensitive to the virtues of healthy teeth and a glowing smile, but in the face of other severe hardships, they ignored dental needs until those needs became dire. The result was unfilled schedules for established dental practitioners and mass unemployment for younger graduates. The Depression, from this vantage point, short-circuited dentistry's drive toward parity with medicine and fostered professional degradation.

As times became hard for dentists in the 1930s, the ADA joined organized medicine in denouncing those who called for substantial government intervention to guarantee the public adequate health care

[1]See Michael Sedlak and Robert Church, "A History of Social Services Delivered to Youth, 1880–1977," Final Report to the National Institute of Education, Contract No. 400-79-0017, 1982.

[2]See footnote 5, p. 19.

[3]Dunning, *Principles*, p. 48.

and to provide employment for health professionals. Ideological controversy continued to center on the concept of "state medicine." The controversy was fanned by the famous 1932 report of the Committee on the Costs of Medical Care, and by the discussions preceding enactment of Social Security legislation in 1935, which upheld the possibility of compulsory health insurance as a component of Social Security. The ADA felt strongly on the issue, to say the least:[4]

> State dentistry is wrong in principle and would be disastrous in practice. Through such a medium, dentistry never would advance, nor would the people ever be properly served. Individual initiative—the stimulant of professional progress—would wither at its source, and the incentive to scientific study would be forever gone. Government domination of the individual has been carried too far already. It is the incubus on our citizens that today threatens not only the welfare of the people, but also the very stability of society at large. Under the false pretense of lending succor to the needy, government has usurped a prerogative that does not legitimately belong to it.
>
> An emergency has been seized on to institute methods of relief that were supposed to be temporary in character, but which have been blandly warped into a precedent for permanent procedure. Not only that, but the question of so-called relief has been used as a political football to work up propaganda in favor of certain radical ideas that are not conducive to the best interests of the people or the profession.
>
> It is going to be difficult to down this monster of exploitation of the dental profession, and, unless we are alert, we shall have fastened on us a system of dental practice that will not only bring ruin to our individual practitioners, but will also result in inefficient service to the people.

Yet, for all the emotion that the threat of "state dentistry" called forth, the profession nonetheless tolerated the free delivery of dental services to schoolchildren, whether under the control of school boards, health departments, lay groups, or charitable organizations. The ADA may have felt that "a large part of the people of the earth are in danger of going soft from the demoralization of the dole," but that fear did not extend to "helpless children" who could be reached in no other way than via the "dole" of school dentistry.[5] Free school service, from the perspective of organized dentistry, presented no appreciable threat because there was even less likelihood in the 1930s than earlier that children would show up at private dental offices, or that they would be

[4]*Journal of the American Dental Association*, Vol. 21, October 1934, p. 1849; and Vol. 21, November 1934, p. 2038.

[5]*Journal of the American Dental Association*, Vol. 21, November 1934, pp. 2037–2038.

able to pay for treatment if they did show up. Moreover, as the ADA staff grudgingly acknowledged, even in the depths of the Depression, most established practitioners still preferred not to have children as patients or to use chair time to preach and teach the virtues of preventive dentistry.[6]

School service remained throughout the Depression a means for dentistry to sell itself to the public and to fulfill its obligations as a genuine profession, one that was committed to both the prevention of disease and the donation of free service to the needy. If, in the process, children learned to prize oral health and the contributions dentistry could make to it, then all the better for the future economic well-being of the profession. The immediate risk to private practice seemed minimal, while the potential payoffs, in terms of buttressing professional stature, of cultivating future clientele, and of providing immediate employment for young dentists, were considerable. School service consequently escaped the profession's wrath against "state dentistry" during the Depression and thrived at a time when the economic fortunes of dentists reached an all-time low.

Unfortunately, it is impossible to indicate precisely how many more children were served and how much more school dental service was available by the end of the Depression than was available at the beginning (or at least as of 1930, when the Leuck survey was conducted). Three large-scale surveys were conducted between 1936 and 1943 that addressed the question in different ways, but none did so adequately or in a manner that provided data that could be easily compared with data from earlier periods. The potentially most useful survey was conducted by the ADA in 1943, and preliminary results were reported by the year's end. However, the full, detailed findings of the survey appear never to have been published, perhaps due to wartime exigencies. While the preliminary results were fascinating, they only scratched the surface and must be used cautiously for purposes of comparing program development over time. A second major survey, covering over 200 cities, was undertaken by the Cleveland Child Health Association in 1936. Unfortunately, the data collection process was sloppy and unsystematic, and the survey remains useful primarily for the wealth of descriptive detail it collected on the social organization of dental services for children. The final survey, also conducted in 1936, examined dental services for children under "health agency" auspices in 94 selected counties. Although more limited than the other two sur-

[6] *Journal of the American Dental Association*, Vol. 23, August 1936, pp. 1098–1099.

veys, it provided important insights on the status and significance of school dentistry during the Depression.

## THE INCOMPLETE ADA SURVEY

In mid-1943, the ADA sent 6,000 questionnaires to school superintendents to determine the size and scope of school dental programs throughout the country.[7] By year's end, 885 superintendents had reported the existence of school dental programs in their districts (the number of superintendents who responded but reported no programs is unknown); 753 provided sufficiently detailed information to classify the programs by type of service. The three primary classifications were education, periodic dental examinations, and operative treatment. Only 10 percent of the reported programs were solely educational. An additional 25 percent combined education with periodic examinations. Only 16 schools provided solely operative services. By far the largest portion of schools, nearly two-thirds (472), combined education with operative treatment. Approximately 86 percent of the reported programs were in use in grades one to six; about 50 percent of the programs extended into the high school.

Since the returns from the survey were not yet complete when the preliminary results were reported, the number of superintendents reporting dental programs for 1943 could only have increased afterward. Hence, the 488 programs offering operative treatment represented the absolute minimum. What remains uncertain is whether respondents reported solely on programs run by the schools themselves, or whether they also included programs run in the schools by health departments or other agencies, or programs run exclusively for schoolchildren in diverse locales off school grounds. If the 1943 data reflected only operative programs run by the schools themselves (or by a school in formal partnership with another agency), the number of reported programs would represent approximately a one-third increase over the operative programs identified in the 1930 Leuck survey. However, if all the programs that served school children exclusively were reported, then the difference between the two periods is less than 10 percent (there were 452 such programs in 1930). All that can be said with confidence is that there were surely more school dental programs providing operative services in 1943 than in 1930. Whether the operative programs in 1943 dealt with more children, and what range of services they provided, are impossible to determine.

[7] *Journal of the American Dental Association*, Vol. 30, November 1943, pp. 1820, 1826.

## THE MOUNTIN-FLOOK SURVEY

A survey of dental programs in 94 counties conducted in 1939 by two medical researchers, Joseph Mountin and Evelyn Flook, offered a different perspective on Depression-era dental services for children.[8] In 22 of the 94 counties (23 percent), there was no public provision of dental services. Those areas tended to be disproportionately rural and small.[9] Within the 72 counties that sponsored dental programs of some kind, the authors identified 390 relevant agencies: 100 health departments, 169 designated as other official agencies (chiefly the health service divisions of departments of education), and 121 classified as nonofficial or voluntary health agencies. Despite the diversity of sponsorship, 98 percent of the individuals served by these agencies were schoolchildren. Consequently, the authors excluded adults from consideration and dealt solely with dental services for schoolchildren.

Mountin and Flook found considerable association between county size, type of sponsoring agency, and amount and range of dental services delivered. The amount of dental services delivered by all public agencies rose dramatically with county size. Only in the largest counties (those with populations of over 500,000) did as many as 20 percent of the schoolchildren receive corrective services by public agencies. Counties of different sizes also differed substantially in the dominant types of agencies that sponsored dental services. In the smallest (under 40,000 population) and largest counties, health departments were the dominant service providers, whereas in the rest of the counties, other official agencies, chiefly schools, were the dominant providers. Nonofficial agencies were significant service providers in only the largest counties.

When the range of services is examined, the importance of distinguishing the different sponsoring agencies becomes clear. There were dramatic differences in the ratio of examinations to preventive and remedial services among programs with different sponsoring agencies. Health departments devoted less than one-third of their energies to examinations, whereas other official agencies (i.e., schools) devoted nearly three-quarters. Thus, the counties served primarily by school

[8]Joseph Mountin and Evelyn Flook, "Dental Programs Sponsored by Health Agencies in 94 Selected Counties," *Public Health Reports*, Vol. 54, September 8, 1939, pp. 1625–1636. Although unnamed, the counties were "disproportionately urban and include most of the large cities of the country. As a result, health services of all types are probably much better developed in the study areas than in the nation as a whole" (p. 1626).

[9]Mountin and Flook chose to include the populations of these counties in computing the amount of service rendered to all communities. This decision inevitably reduced the proportion of individuals reported as actually being served in those counties that did offer programs.

dental programs had primarily informational programs. Only one-fifth of school services consisted of fillings, extractions, or more complex forms of corrective treatment. Health departments, however, concentrated their services on remediation: nearly two-thirds of their services were devoted to fillings, extractions, and other reparative treatments. Interestingly, none of the sponsoring agencies devoted much time to prophylaxis or oral hygiene. During the Depression, the centrality of oral hygiene to publicly sponsored dental programs probably declined somewhat.

Perhaps the most interesting of Mountin's and Flook's data concerned the proportions of *total* dental services received by children that were provided by the various public agencies. Relying on several different studies of children's dental needs, Mountin and Flook acknowledged that services fell far short of fulfilling those needs. Public agencies met perhaps 15 percent of the need for extractions and only 3 percent of the need for fillings. But these calculations are deceptive. They far underestimate the contributions of publicly sponsored dental service programs to the total dental service picture. Drawing on a seminal study by Collins[10] of dental utilization patterns in the white population in 1939, which revealed how infrequently schoolchildren's dental needs were actually attended to, Mountin and Flook concluded that public agencies supplied 40 percent of the fillings, 50 percent of the extractions, and 52 percent of the prophylaxes that schoolchildren received from *any* source at a time when children's dentistry was not well accepted by either the public at large or the mainstream dental profession. In other words, public agencies were playing a major role in American dentistry. To be sure, tremendous unmet need remained, but the public sector—where services were primarily free—was nearly on a par with the private sector in providing dental services to schoolchildren. School dentistry was thus not marginal but central to the practice of children's dentistry.

## THE CLEVELAND CHILD HEALTH ASSOCIATION STUDY: MILWAUKEE VERSUS LOS ANGELES

The ADA and Mountin and Flook surveys offered two different perspectives on school dentistry during the Depression era. Although not comparable with each other or with the Leuck surveys, they provide solid evidence that school dentistry remained very much alive during

[10]Selwyn Collins, "Frequency of Dental Services Among 9,000 Families, Based on Nation-Wide Periodic Canvasses, 1928–31," *Public Health Reports* 54, April 21, 1939, pp. 629–657.

the Depression. School dentistry reached its most extensive development in the largest cities, but it was common in smaller communities as well. The descriptive data collected by the Cleveland Child Health Association on nearly 400 cities between 1936 and 1938 are most helpful in providing a vivid sense of the social organization of children's dental services.[11] We consider only cities with populations over 500,000, which accounted for over 70 percent of the total school population and over 78 percent of the total dental services. Milwaukee and Los Angeles may be taken as illustrative.

A formal dental program for children in Milwaukee was begun under the auspices of several prominent dentists in 1910. Soon afterward, it was transferred to the school board, and finally, following World War I, it was relocated in the health department. By the mid-1930s, the program employed the equivalent of six full-time dentists, one and one-half dental hygienists, and one physician working two-fifths time to provide operative, prophylactic, and educational dental services to children.

The program was systematically planned, organized, and implemented. Every year and a half, beginning with kindergarten children and extending through the fourth grade, two dentists and three hygienists inspected the teeth of the city's schoolchildren (both public and parish schools), using a portable dental chair, tongue depressor, and mirror and explorer. Prior to their visits, the hygienists worked with each school principal to make certain that teachers had completed necessary paperwork to keep a permanent dental record on each child. After the inspections were completed, formal education began. The hygienists went from class to class delivering brief lectures and toothbrushing lessons, after which they sold toothbrushes to the children at a nominal cost. Following the individual classroom instruction, the hygienists delivered illustrated lectures, aided by motion pictures, to two classes at a time on the growth and uses of the teeth and how diet affected their development. In addition to lectures and demonstrations, the hygienists provided a thorough prophylactic treatment on every child in the second or third grade (in schools with over 250 pupils), using a portable stand, detachable cuspidor, aseptic stand, and a complete set of prophylactic instruments. In addition, the hygienists gave three pupils from each higher grade a complete prophylaxis in order to hold them up to their peers as models of mouth cleanliness.

Ninety percent of Milwaukee's schoolchildren were found to need dental treatment. The hygienists sent notices directly to parents,

[11]Cleveland Child Health Association, *A Survey of Mouth Hygiene Programs for School Children*, 5 Vols., Cleveland: Cleveland Child Health Association, 1936–1938.

advising them of the inspection results, along with a pamphlet on the care of the teeth; they also informed school nurses of the most severe cases to make sure those cases were followed up. The nurse then ascertained the economic status of each student's family. If the family was indigent, she obtained a consent from the parents and registered the child for service in one of three fully tax-supported dental clinics operated by the health department. Alternatively, she referred the child to the part-pay dental clinic at Milwaukee Children's Hospital (funded mainly by the Community Chest) or to the free clinic at the County Dispensary. The health department clinics maintained five chairs in three different sections of the city. Three of the chairs were open 40 hours per week, and all ran 50 weeks per year, so that children could receive service during the summers and after school as well. While the school nurse generally arranged clinic appointments for students and accompanied them to and from the clinics, eligible parents were also permitted to bring children needing immediate care directly to the clinics themselves. In 1936, the three health department dental clinics served 7,483 children, or around 9 percent of the total elementary school population (this does not include the several thousand children given prophylactic treatments by hygienists in the schools, or the 35,011 given dental inspections).

The clinics concentrated service on younger children, primarily those under 12 years of age. They also performed operative work on older children with badly infected teeth, and they provided relief for all eligible children with toothaches, regardless of age. The clinics' primary objectives were to preserve the teeth of younger children and to prevent serious infection, as well as to demonstrate to children and their parents the value of early, regular dental treatment. Children referred to the clinics before the eruption of their six-year molars received comprehensive dental care consisting of prophylaxis, extractions, fillings (mainly amalgam), and a variety of treatments. The clinics did not do gold, crown, or bridge work. The children were entitled to at least one additional visit to the clinic for complete dental care prior to their ninth birthdays. Children referred to the clinics for the first time between the ages of nine and twelve were provided full dental care, but they were not allowed to return for clinic service again except in case of emergency. This policy was obviously intended to limit the number of children who could use the clinics for repeat service, and to extend the available facilities to more children, while helping to preserve the children's teeth at a key period of their development.

The Director of Milwaukee's dental program stressed that its prime purpose was educational, but that this very educational process called

forth the need for public dental services for children. "With a continued round of lectures to the children in the schools, and before Parent-Teachers groups emphasizing the importance of dental care, and the sending home of defect notices and educational material on the care of the teeth," he observed, "the demand for free service becomes a problem which can only be solved by the establishment of dental clinics. . . . The Dental Society, the school officials, and public health officials are all very much in accord in approving the dental health program as it is carried out in the city of Milwaukee, and feel that it is an asset to the community."[12]

The social organization of school dentistry in Los Angeles was considerably different from that in Milwaukee. The dental program was controlled administratively by the Board of Education, in close cooperation and with partial financial subsidy from the city's very active Parent-Teachers Association. Unlike most dental programs run by boards of education, especially in smaller cities, the Los Angeles program provided very little education, either formal or informal, through classrooms or in tandem with dental examinations. The relative lack of attention to education was reflected in the fact that no dental hygienists were included in the program and prophylactic services were restricted to children showing signs of serious gum disease. Formal education was limited to yearly 20-minute talks by school nurses to each elementary school classroom and lectures before parents' and teachers' meetings. Reparative treatment rather than prevention was the prime aim of the Los Angeles dental program.

Unlike Milwaukee, the dental inspection and referral service in Los Angeles, although extensive, was relatively informal and not under the control of dental personnel. Some 80,000 children, or 40 percent of the elementary school population, had their teeth examined in the schools each year. The dental inspections, however, were conducted primarily by physicians, and occasionally by nurses, as part of a general physical examination. Only tongue depressors were used to identify dental defects. Not surprisingly, given the superficiality of the dental examinations, fewer than 20 percent of the children examined were identified as having "marked dental decay." The Assistant Director of school health services readily acknowledged that professional dental examinations would probably raise the proportion to 90 percent. However, he chose not to invest his dental staff's time in inspection because the school physicians were identifying more serious decay than clinic dentists could repair. His attitude reflected and confirmed the Los

[12]Ibid., Vol. 1, pp. 200–201.

Angeles dental program's emphasis on treatment over education and prevention.[13]

In 1936, the Los Angeles Board of Education operated 17 dental clinics, 12 of which were located on school premises. To accommodate the dispersed population of the city, two traveling healthmobiles with full-size dental equipment and three portable dental units were provided to serve outlying schools. These 17 clinics contained 22 chairs which operated 350 hours per week, or an average of approximately three hours per school day per chair. Unlike the Milwaukee clinics,[14] the Los Angeles clinics operated only during the school year. They were run by one supervising dentist, 20 additional dentists, 20 dental assistants, and three clerks. A large proportion of the dentists were employed only part-time, although all were paid for their services. The Board of Education paid the bulk of clinic costs from tax funds, but these were supplemented to some undetermined extent by PTA contributions.

For the school year ending June 1936, the clinics served 18,919 school children in 34,263 sittings, both of which represented higher proportions, relative to population, than in Milwaukee.[15] Like the Milwaukee clinics, those in Los Angeles performed a wide range of reparative work but did not provide gold fillings, bridge work, or orthodontia. Although the bulk of children served in the clinics were given free service, fully 40 percent were adjudged able to pay partially for treatment and were assessed a 25-cent registration fee. The only reason the school clinics chose to serve them, argued the Assistant Director, was that Los Angeles' social agencies provided too few part-pay facilities for children whose parents were not indigent but could not afford the services of private dentists. Thus, the Los Angeles school dental clinics consciously served a large number of children whose parents were, in all likelihood, regularly employed but earned too little to pay for services in the private sector.

The most tantalizing Los Angeles data concerned the proportion of children who received dental services from any source in the 1935–1936 school year who did so at school dental clinics. The data are not clear. School nurses recommended approximately 50,000 children to see a

[13]Ibid., p. 7.

[14]Data on average operating time per chair in Los Angeles and in Milwaukee are not strictly comparable, but it is reasonably clear that while the average time per chair in Milwaukee was considerably greater, the total hours of operating service for children during the entire year, proportional to total population, were more or less the same for the two cities.

[15]The higher proportion of service in Los Angeles may be related to the deemphasis of prophylactic services, which were performed extensively in both Milwaukee's clinics and its classrooms, and which tend to be highly time-consuming.

dentist on the basis of school inspections. By year's end, approximately 26,000 claimed to have done so. This number was probably high. It was well-known that children at the time often said they had seen a dentist when they had not, and the Los Angeles inspection system was informal and provided no systematic means of double-checking. If we assume that the overwhelming majority of the 18,919 children who received clinic service were also those whom the nurse had referred on the basis of examinations during the same school year, it would appear that the clinics were providing a very large portion of all dental services received by Los Angeles schoolchildren. The Los Angeles data thus tentatively reinforce Mountin's and Flook's argument that while school dentistry in the 1930s did not come close to meeting children's dental needs, it was in fact a mainstay of children's dentistry at a time when it was still highly uncommon for children to utilize dentists in private practice.

## CONCLUSION

Several key points stand out in this overview of school dentistry during the Depression. First, dental service was not eliminated from the schools as being marginal to educational functions during a period of severe economic retrenchment. On the contrary, the special possibility represented by a hostage school population for identifying and, if necessary, treating or facilitating the treatment of children's dental problems was reaffirmed during the Depression, on both humanitarian and pedagogical grounds.

Second, the structural framework for delivering dental education and services via the schools had been well-established prior to the Depression. School dentistry was born before World War I and was nourished by the prosperity and optimism of the 1920s. Thus, the Depression did not kill school dentistry, but it did not give birth to it either.

Third, while it is difficult to demonstrate conclusively, school dentistry almost surely expanded nationwide during the Depression era. The numbers eligible for free service increased as indigency grew dramatically during this period. In Los Angeles, and probably elsewhere as well, children were admitted to school service even if their parents did not formally qualify as indigents but were nonetheless too poor to pay for essential treatment. Moreover, particularly by the end of the 1930s, federal monies became available to subsidize municipal and state-supported health services. Not only Social Security, which especially built up state dental programs, but also the Federal Emergency Relief Administration (FERA) and the Works Progress Administration

(WPA) made monies widely available to subsidize dentists in school and other clinic programs. In New York City, for example, the school dentistry force more than doubled within a few years thanks to FERA and WPA monies, which were used to provide half-time jobs for unemployed dentists.[16] With dental societies alert to the availability of federal largesse, the pressures to expand school dental forces as a relief measure must have been considerable. Finally, while the 1943 ADA survey did not necessarily demonstrate vast expansion of school dentistry during the Depression, it seems probable that by the time that survey was conducted, operative treatment programs had already declined from their Depression-era peak. Following America's entry into World War II, as discussed in the following section, the armed forces drafted thousands of dentists into service and thereby sapped communities of manpower to run school programs. Had the ADA survey been conducted in 1940 rather than 1943, it would probably have demonstrated a more substantial increase in school-based dental treatment programs.

A final point regarding Depression-era school dentistry concerns the profession's general attitude toward children as patients. While service to children became more of a rallying cry than ever before among the profession's elite in the 1930s, culminating in the founding of the *Journal of Dentistry for Children* in 1933, it appears to have struck little immediate response among the rank and file. Hard times notwithstanding, the practical disadvantage of treating children remained a predominant concern of dentists in private practice. To the extent that dentists cultivated the child market in the 1930s, it was via the schools rather than in private practice. As one pioneer in children's dentistry, John Oppie McCall, observed in 1944, "Experience shows us that an extremely large number of practicing dentists are unwilling to care for children. We cannot expect this condition to change."[17] The editor of *The New York Journal of Dentistry* opined a few years earlier that practicing dentists were not "keeping faith with the school child." Although school authorities were "constantly referring children to their dentists for needed dental care," the dentists, to say the least, were not overly thankful:[18]

> It is time dentists on their part gave due consideration to the confidence shown them by the aforementioned agencies by giving their full cooperation in taking care of the teeth of schoolchildren. Too many dental practitioners are wont to give "telephone diagnoses" and

[16]Board of Health, New York City, *Annual Reports*, 1934–1941.

[17]John Oppie McCall, "The Dental Hygienist and Dentistry for Children," *Journal of Dentistry for Children*, Vol. 2, 1944, p. 95.

[18]J. A. Salzmann, "Keeping Faith with the School Child," *New York Journal of Dentistry*, Vol. 11, October 1941, pp. 339–340.

> many have been known to send "completion letters" for children whom they had never actually seen, to say nothing of the practice of granting completion letters to those whose treatment has not been completed. There are today many dentists who are still in the habit of waiting for the "little hole" to become larger and who neglect to fill teeth in spite of all the talk about preventive dentistry that they have been hearing for years.

In short, there is little reason to believe that the Depression heightened the dental profession's fears regarding the school as a threat to private practice. School clinics continued to enjoy substantial support from organized dentistry as a means to fulfill professional charitable obligations, to demonstrate commitment to preventive health goals, and to serve a clientele largely unwanted in private practice. To the extent that children received dental treatment at all prior to World War II, the school played a major role.

# V. SCHOOL DENTISTRY AND THE NEW PROSPERITY: 1941-1961

"When four million Americans were drafted for the War [World War I]," wrote a reporter for *Life Magazine* in 1939,[1]

> the United States suddenly became acutely tooth-conscious. The vast majority of these men had never been inside a dentist's office, had never used a toothbrush. They had firmly believed that teeth needed no more care than fingernails and accepted toothaches as a matter of course or blamed them on the weather. But with the draft came medical examinations, which revealed the sad state of the nation's teeth. In less than two years, the Army did a colossal job of dental overhauling. When the soldiers returned home, millions carried with them their first idea of proper tooth care.

Whatever momentary inspiration to dental health World War I may have provided, its long-term impact on the nation as a whole appears to have been limited. As revealed by the Army draft medical examinations of 1940, the state of young male Americans' teeth was appalling. Dental disease was as widespread as ever. Rampant oral disease, it was widely argued, was undermining America's military preparedness. At least 90 percent of the draftees were affected, and much of the disease was serious. Approximately one out of four men was rejected because he did not have two opposing serviceable natural teeth. Because this high rate of rejection jeopardized military recruitment needs, selective service officials had little choice but to eliminate dental requirements for induction, following the initial draft examinations. They placed their hopes instead on a vastly enlarged armed forces Dental Corps to provide essential treatment before and after troops were assigned overseas.[2]

Organized dentistry was quick to emphasize that Americans' poor dental health was not its fault. In 1940 and 1941, it launched a two-pronged, patriotic campaign: first, to encourage dentists to treat the diseased mouths of potential enlistees free of charge, and second, to gain entry for large numbers of dentists into the armed services, at the same rank as physicians. Both campaigns were successful. Dentists enlisted or were recruited by the thousands to prepare draftees for service and to keep them dentally fit to fight. As younger and recently

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[1] *Life Magazine*, January 16, 1939, p. 49.

[2] William Davis, "Dentistry and the Public Health Movement," in *Dentistry in Public Health*, p. 21; *The New York Times*, December 30, 1940, p. 28.

graduated dentists joined the armed forces in droves, older dentists who remained at home found themselves far better off than they had been since the beginning of the Depression, and with many fewer dentists to compete against for clientele. For the first time since the 1920s, there was serious discussion about a shortage of dentists to meet domestic demand.

In short, wartime experience confirmed the importance of dental health for general health, reduced economic competition within the profession, and enhanced the status of dentists as vital medical practitioners. At war's end, dentists carried with them the prestige of patriotic service at high military rank, the experience of having sharpened and learned new restorative skills faster than would have been possible in peacetime, and the thanks of several million servicemen who had been newly introduced to complete, free dental care. The wartime experience surely did nothing to advance oral hygiene and the preventive ethos, but it did wonders for selling the larger public on the mechanical technology for which American dentistry had long been famous.

## DENTISTRY'S POSTWAR BOOM

In the decade following the war, the private practice of American dentistry boomed as never before. Dental schools—whose numbers had been cut back abruptly in the 1920s—struggled (with the aid of new federal subsidies) to meet rising public demand and to satisfy the armed forces' need for dentists. School clinics and other public agencies that had grown accustomed to calling upon unemployed or underemployed dentists on an hourly per capita or fee basis to treat children now found that dentists no longer had the time or financial inclination to participate in such arrangements. Public expenditures for dental services in the late 1940s and 1950s expanded at a rate substantially greater than the growth of the economy. More dentists reported themselves as struggling to satisfy public demand than as desiring more clients; the majority felt they had as many patients as they wanted.[3]

In the postwar era, moreover, the proportions of schoolchildren receiving private dental care expanded dramatically. To be sure,

[3]Philip Blackerby, Jr., "Treatment in Public Health Dentistry," in *Dentistry and Public Health*, p. 211; N. Doherty, "Economic Growth in the U.S. Dental Industry, 1950–1977," *Journal of Dental Education*, Vol. 45, 1981, pp. 277–281; James Dunning, *Principles of Dental Public Health*, 1st ed., Cambridge, Massachusetts: Harvard University Press, 1962, p. 243.

children's service utilization still varied significantly according to their parents' income, education, and race. Furthermore, over one-quarter of the children between the ages of 5 and 14 had never seen a dentist. Nonetheless, by the late 1950s, nearly half of the school-age population was visiting a dentist about once per year.[4] This suggested both a profound reorientation of American dental care habits and an equally profound reorientation of dental practitioners' readiness to welcome the baby-boom generation as part of their regular practice. Only in the 1950s did the concept of the "family dentist" become something more than a professional affectation by which dentists sought to wear the mantle of physicians. To participate fully in the postwar economic resurgence, practitioners much more readily accepted children along with their dentally conscious parents.

If World War II and postwar prosperity helped transform the professional status and economic position of American dentistry, another series of wartime events provided a tremendous boost to dentistry's claims to be a scientific profession devoted to the prevention, not merely the treatment, of disease. The preventive possibilities of fluoride for dental caries were not discovered overnight, but not until the mid-1940s were researchers able to provide a firm empirical foundation for what had previously been speculation.[5] The discovery of the beneficial effects of fluoride came at just the right time to rescue dentistry from its Depression-era intellectual doldrums. During the late 1930s, the profession had seemed farther away than ever from discovering how to prevent tooth decay. Faith in oral hygiene and diet as surefire preventive measures had declined rapidly in the face of unfavorable scientific evaluations and recognition that the public was not going to use either method well enough or consistently enough. The reigning preventive nostrum was Thaddeus Hyatt's "prophylactic odontotomy," or the early filling of small pits and fissures to prevent the onset of serious tooth decay.[6] Hyatt's remedy demonstrated just how far researchers were from discovering a quick, painless, nontreatment-based preventer of dental caries that could, as vaccines had done for medicine, boost the profession's prestige while advancing public health.

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[4]Byron Hollinshead (ed.), *The Survey of Dentistry*, Washington, D.C.: American Council on Education, 1961, pp. 21–24. Hollinshead's prime source is Division of Public Health Methods, U.S. Public Health Service, *Health Statistics from the U.S. National Health Survey: Dental Care, Interval and Frequency of Visits, United States, July 1957-June 1959*, U.S. Public Health Service Publication No. 584-B14, Washington, D.C.: Government Printing Office, 1960.

[5]These research advances helped pave the way for the founding of the National Institute of Dental Research in 1948, and the dramatic expansion of federal funding for scientific research in dentistry during the next quarter century.

[6]Thaddeus Hyatt, *Prophylactic Odontotomy*, New York: The Macmillan Co., 1933.

Organized dentistry was quick to promote the promise of fluoride for public health. By 1945, the ADA had adjudged laboratory research on fluoride's positive effects sufficiently conclusive to give its enthusiastic approval and to sponsor the launching of two carefully monitored community water fluoridation experiments in Newburgh, New York, and Grand Rapids, Michigan. Experimentation also began at scattered locations with the addition of fluoride supplements to children's diets, and with the application of topical fluorides to children's teeth. By 1949, for example, over 30,000 New York City schoolchildren were receiving sodium fluoride treatments.[7] Although the Grand Rapids and Newburgh experiments were planned to last ten years, after five years they had so clearly recapitulated the experiences of communities with naturally fluoridated water supplies of similar concentrations that they were widely hailed as successes. In 1950, the U.S. Public Health Service strongly advised communities to fluoridate their water supplies, and in 1951 the AMA gave its prestigious imprimatur. By the end of the 1950s, nearly 2,000 communities serving over 33 million people had fluoridated their water supplies. This included more than 60 percent of the cities with over 500,000 population (New York did not fluoridate until 1965, and Los Angeles still has not done so).[8]

## SCHOOL DENTISTRY AND THE POSTWAR BOOM

The rising prestige and economic vitality of the dental profession, and the discovery and rapid popularization of fluoride as a preventive measure inevitably cast school dentistry in a new light. As noted earlier, many dentists who had once gladly worked at low hourly wages in school programs no longer desired or had the time to do so. In addition, children of the baby-boom generation were becoming more and more integral to the private practice of dentistry. Although school programs served primarily those children whose parents could not purchase dental services, the very existence of such programs, from the profession's perspective, could now reasonably be portrayed as a potential constraint on private practice, particularly on the prices dentists could charge for performing the same basic operative services that school clinics performed free.[9] School dentistry was thus no longer a

[7]Department of Health, New York City, *Annual Report*, 1949, p. 78.

[8]Dunning, *Principles*, 1st ed., pp. 356, 375–376.

[9]Clinic programs also provided a more immediate threat concerning who would control and administer fluoride treatments. The public tended to view topical fluoride applications as a very simple procedure that did not necessarily require a dentist's service. A number of battles were fought by organized dentistry in the late 1940s and 1950s to try to keep topical fluoride applications in private dentists' offices rather than in public

clear positive benefit to the profession. As dentistry achieved full public and professional legitimacy as a critical health service, the entrenched status of school dentistry became increasingly suspect as a potential obstacle to the establishment of private practitioner control over children's dentistry.[10]

From the early 1950s onward, organized dentistry adopted a condescending stance toward school dentistry similar to the stance that organized medicine had adopted three decades earlier toward school health service programs. They portrayed school dentistry as an unfortunate legacy of the Depression era. School clinics were alleged to be staffed by lesser or inexperienced dentists who cared little about prevention and who provided irregular treatments that did little or nothing to improve the future oral health status of their patients. Many dental inspection programs, it was charged, were grossly superficial, resulted in no follow-up, and gave parents the false impression that further professional examination and treatment were unnecessary. The profession's position was well stated by a school health committee appointed by the Federal Security Agency in 1949, which viewed the school generally as an inappropriate setting for clinical practice. "Parents have the primary responsibility for the health of their children. Health service programs should be designed to assist parents in discharging their responsibility but not assume it for them."[11] In other words, the school's proper role in dentistry was purely to educate, not to provide treatment. In the eyes of organized dentistry, school service programs were a badge of shame from a bygone era that children, schools, and the profession alike were better off without.

Sentiment against school dentistry found additional support from the health education profession, for two main reasons: First, health educators of the 1950s tended to believe that recent advances in the psychological understanding of children's learning had at last made it possible to design pedagogically effective dental health education programs.[12] Second, the growing consensus within health education was

school hygienists' hands. See *New York Journal of Dentistry*, Vol. 18, August-September 1948, pp. 244–247.

[10]Although we have not investigated the subject, the introduction of Crest toothpaste in 1955 and the popularity of school "brush-ins" during the following decade (which received strong dental practitioner support) also surely influenced professional opinion on the value of traditional school dental programs.

[11]Federal Security Agency, U.S. Office of Education, *Priorities in Health Services for Children of School Age*, cited in Charles Wilson (ed.), *School Health Services*, Washington, D.C.: National Education Association and American Medical Association, 1953, p. 127.

[12]The *Journal of School Health* was the professional vehicle through which health educators tried to persuade one another on this point.

that it was unwise to emphasize dental needs over more general health needs. Hence, the argument went, if dental hygienists were to be employed at all, they should be employed to teach regular classroom teachers rather than students directly.[13] Thus, health educators in the postwar period were understandably supportive of organized dentistry's opposition to clinic dentistry as a school responsibility.

Whatever the leaders of the dental and educational professions may have considered the proper role for schools to play, the remarkable fact was that at least until 1960, school dentistry appears to have remained as firmly entrenched as ever. Indeed, school dentistry may have experienced some expansion in the decade and a half following World War II. Two surveys conducted during the middle and late 1950s suggested that school dentistry was a grassroots social service that individual communities considered sufficiently valuable to sustain in the face of professional opposition. Although on the defensive as never before, school dentistry remained very much alive.

## THE ADA SURVEY OF 1955

In 1955, the ADA's Bureau of Economic Research and Statistics queried over 3,500 school superintendents in cities with over 2,500 population about the existence and characteristics of school dental programs under their jurisdiction. They defined school dentistry very broadly, as "any program utilizing in any way the services of dentists, dental hygienists or dental assistants, which is conducted by or through the public schools."[14] Over 2,200 city superintendents responded, of whom 60 percent, representing 1,343 cities, reported dental programs. This was a substantially higher number than that reported in the 1943 ADA survey (the questionnaire for which, it should be recalled, was sent to a much larger number of superintendents).

As in earlier eras, the existence of school dental programs varied considerably by city size, but they were pervasive nationwide. Eighty-seven percent of cities with more than 100,000 population reported school dental programs in 1955, as contrasted with only 47 percent of cities with 2,500 to 5,000 population. In more than three-quarters of the cities, some or all of the school dental services were provided in school buildings. Public schools rather than public health agencies remained by far the major locale for providing dental services.

[13]See Dorothy Nyswander, *Solving School Health Problems*, New York: The Commonwealth Fund, 1942, p. 221.

[14]"Survey of Public School Dental Programs," *Journal of the American Dental Association*, Vol. 51, November 1955, p. 594.

Part-time dentists remained the mainstay of school dental programs in 1955 (although cities with over 100,000 population now employed a substantially larger proportion of full-time dentists than in earlier years—one-third versus one-fifth in 1930). Over four-fifths of the cities employed part-time dentists, versus one-fourteenth employing full-time dentists. Dentists (part-time and full-time) were the sole service providers in about three-fifths of all cities.

Very few hygienists were employed part-time, and only about one-quarter of the cities employed hygienists at all. Dentists appeared to play more prominent roles in school programs in 1955 than in 1930.[15] However, in about 40 percent of the cities that employed hygienists, the hygienists provided all dental services. Moreover, over half of the cities with over 100,000 population employed hygienists, often in large numbers.

The payment structure for dentists in school service programs changed in one notable way between 1930 and 1955. In 1930, over four-fifths of participating dentists were on salary. No matter what the size of the school dental clinic, dentists rarely donated their time. In all likelihood, they simply could not afford to do so. In the mid-1950s, however, with dentistry a higher-status profession and dentists far better paid in private practice, over two-fifths of the part-time dentists donated their services. Another one-quarter received payment from lay groups like the PTA, doubtless at substantially less than private practice fees.

The great majority of cities included dental examinations as part of their school programs. Reflecting changing professional opinion on their utility, however, the proportion was somewhat lower in 1955 than in earlier decades, and the tendency was decidely against annual examinations.

The place of operative treatment in school dental programs remained as central in 1955 as in earlier decades. Three-fifths of the cities—over 800, a much larger number than ever before—reported some dental treatment by dentists. While cities reserved operative treatment for "underprivileged children," there was substantial variation by city size in how much treatment was provided. Only slightly more than one-third of the cities with between 2,500 and 5,000 population, for example, provided fillings and extractions for underprivileged children, whereas nearly three-fifths of the cities with over 50,000 population did so. Larger cities (over 100,000 population), moreover,

[15]This was, in all likelihood, a legacy of the Depression, when unemployed dentists had clamored for entry into school service and, as men, had received greater consideration from government subsidy programs than unemployed women hygienists and dental assistants.

were far more likely to provide a wider range of treatments than smaller cities, and to use hygienists far more regularly to provide prophylactic treatments.

Perhaps the most interesting new data reported in the 1955 survey concerned treatment programs for children who were not underprivileged. As suggested by the Los Angeles dental service program discussed earlier, it was probably not uncommon for programs that were nominally restricted to the impoverished to embrace a wider group of dentally needy youth, especially to provide extractions to relieve acute pain, but also to repair carious teeth. The 1955 survey provided the first empirical verification of the frequency of this practice nationwide.

Over 10 percent of all cities openly stated that they provided fillings and extractions for all children who requested such service. For every four cities whose school program restricted operative dental treatment to underprivileged children, there was one whose program offered treatment to all who applied. In the smallest cities, the ratio of operative service to underprivileged children, versus all children, was about 1 to 3. In the nation's largest cities (over 100,000 population), the ratio was much higher, about 1 to 6.5, doubtless reflecting the greater frequency of poverty and minority populations in larger cities and, hence, the more practical need to limit clientele. Even among the largest cities, however, 9 percent (approximately ten cities) offered operative service via the schools to all children who requested it. There is no way (short of city-by-city analysis) to determine how many children of fair economic means received all or virtually all of their dental services free or at substantial discount via the schools, or whether the proportion had increased or decreased over time. Nonetheless, the practice remained widespread enough in the mid-1950s to give organized dentistry some pause. School dentistry could not be dismissed lightly as a sop to the poor or an exercise of medical responsibility that did not potentially impinge on professional prerogatives or private earning potential.

The final data of consequence in the 1955 survey concerned fluoride treatments administered by the schools. While public discussion of fluorides was intense in the postwar era, the schools played only a minor role in their application. Approximately 8 percent of the cities reported fluoride treatments to all children of certain ages, with no major variation by city size. The use of schools to launch a mass fluoride-based caries prevention campaign was thus in a rudimentary stage. The possibility of relying on school-based fluoride programs as alternatives or supplements to community water fluoridation, however, had clearly been recognized.

## THE DOLLAR-SANDELL SURVEY OF 1959

The final survey to examine school dental programs in the 1950s—and, as it turned out, the final nationwide survey ever undertaken on the subject—was conducted in the fall of 1959 by Melvin Dollar and Perry Sandell of the ADA.[16] Unlike the researchers who conducted the 1943 and 1955 ADA surveys, Dollar and Sandell queried individual schools rather than the superintendents of school systems about their programs. Moreover, parochial and private schools were included, as well as public schools. Altogether, Dollar and Sandell sent out 9,500 questionnaires to randomly selected schools and received over 3,200 usable replies from a more-or-less representative group of schools (mainly elementary schools). While the data collected were obviously not comparable to those from earlier studies, they were probably more reliable regarding actual practices because they were school-specific rather than school-system-specific. The survey, which also detailed practices in dental health education programs, defined dental service to include dental examinations, oral prophylaxis, topical fluoride applications, and operative dental treatments. For some reason, the authors limited information on operative treatments to fillings, while excluding the common practice in school service programs of providing extractions. If anything, then, the Dollar-Sandell survey probably understated the operative treatment component of dental service programs in the late 1950s.

While Dollar and Sandell were not surprised to learn that dental health education was nearly universal in American schools, they found it "somewhat more surprising" that dental service programs were also widespread, being in operation at three-fifths to three-quarters of the schools reporting.[17] Thus, relatively few of the schools offered an educational program divorced from a service program. While service programs were widespread, they were far more prevalent in large than in small communities. Between 75 percent and 90 percent of the schools in communities with over 100,000 population reported dental service as well as educational programs. On the basis of the lower-end figures on dental service—approximately 60 percent of all respondent schools with operative service, and approximately 75 percent in the largest communities—the school-specific data appear to be fairly consistent with the school-system data reported in the ADA surveys of 1955 and 1943.

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[16]Melvin Dollar and Perry Sandell, "Dental Programs in Schools," *Journal of School Health*, Vol. 31, January 1961, pp. 3–14.

[17] Ibid., p. 5. The authors were unfortunately inconsistent in reporting the exact proportion.

However, the proportions of schools offering specific dental treatments were generally lower than those reported in 1955 for school systems as a whole. This may indicate real decline, or it may simply reflect the different units of analysis. We report the findings without indicating whether they marked any new trends in school dental services.

Somewhat less than three-fifths of the schools provided oral examinations. The examinations that were provided were most often performed by dentists, but next most often by school nurses rather than hygienists (the 1955 ADA survey had indicated that school nurses were more central to dental service programs than had usually been recognized, but the survey failed to collect systematic data on the prevalence).[18] Variation by city size was significant, with the likelihood of an oral exam being provided in schools twice as great in the largest cities as in the smallest. Dental inspections generally led to referrals to private dentists and, in over half of the schools providing referrals, to systematic follow-up to determine whether the child actually did go to the dentist.

Prophylaxis was offered in approximately 40 percent of dental service programs, or about one-quarter of all reporting schools, with the service somewhat more common in larger than in smaller cities. The majority of schools providing prophylactic services did so on school grounds, though a significant proportion sent children to private dentists (less than 10 percent sent children to health department or dental school clinics). Dentists provided the bulk of prophylactic services, followed fairly closely by hygienists. Topical fluoride applications were a rarity, with only one in ten schools involved and little variation by city size—a pattern similar to that reported for school systems as a whole in the 1955 survey. Dental hygienists and dentists participated about equally in providing this service.

As noted earlier, the Dollar-Sandell survey reported only on fillings provided by school service programs, not on extractions. Slightly over 40 percent of dental service programs—about one in four schools overall—provided fillings, proportions similar to the provision of prophylactic service. Unlike the case with prophylaxis, however, variation by city size was substantial, with cities of over 250,000 more than three times as likely as very small communities to fill cavities. Dentists, of course, provided all of this service, nearly half of it in school-based dental clinics but over one-third in private offices. As would be

[18]School nurses, of course, were more acceptable to dentists because they posed no threat.

expected, treatment in private offices was far more common in small than in large cities.

The survey provided no explicit data on the proportion of nonindigent children who received dental treatment in school programs. However, the fact that over one-third of the programs charged no fee for any students receiving service, indigent or nonindigent, whereas two-thirds charged no fee for indigent students, suggested that, as in the 1955 ADA survey, some service programs continued to provide treatment for all.

In reflecting on their survey, Dollar and Sandell were scrupulously noncommittal on the desirability of school dental service programs:[19]

> There is wide divergence of opinion with respect to responsibility for dental service programs. . . . Many school administrators believe that the sole business of schools is education and that health care does not come within the scope of the schools. Others are convinced that the schools have a broader purpose and should provide as many health services as feasible. On the other hand, some public health officials contend that all dental service programs should be under their jurisdiction. In many communities, however, budget limitations have prevented the health departments from taking the initiative in developing dental service programs for children. As a result of the default of the health departments, some schools have needed to institute such plans themselves. . . . While there is disagreement about whether [dental service] is a proper function of the schools, it is evident that a majority of the schools recognize that the dental health of children is neglected and that someone must take the responsibility of doing something about it.

While Dollar's and Sandell's language probably overstated the nationwide prevalence of school dentistry (they readily acknowledged that schools with dental programs were more likely to have responded to their questionnaire), their reflections captured an apparent truth about such programs in the 1950s. That is, the programs can probably best be understood as a grassroots response to children's unmet needs that the schools were in a strategic position to satisfy. While school dentistry in the postwar era surely provided a far smaller proportion of all children's dental services than it did during the Depression, the total number of children served by such programs—if the number of cities offering school dentistry provides any index—may well have been considerably larger. School dentistry remained in the 1950s as a testimony to the spirit first cultivated in the Progressive era and later

[19]Dollar and Sandell, "Dental Programs in Schools," pp. 3–4, 9. Interestingly, *The Survey of Dentistry*, for which Dollar and Sandell conducted their study, was not at all noncommittal—it strongly criticized every aspect of school treatment programs. See pp. 37–39.

reinforced by the Depression, that schools ought to serve as society's principal "legatee" institution for children.[20] Neither strongly loved nor hated, school dentistry remained very much part of the American scene until the dawn of the Great Society era in the 1960s.

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[20]On the conception of schools as "legatee" institutions, see Cremin, *Transformation of the School.*

# VI. THE GREAT AMNESIA: WHATEVER HAPPENED TO SCHOOL DENTISTRY?

In the first edition of *Principles of Dental Public Health* (1962), James Dunning observed: "The most important endeavor in the field of public health dentistry, and the one occupying most time for most personnel, is the administration of school dental health programs at the local level."[1] Dunning apparently did not realize it, but at the time he wrote, school dentistry was just entering a severe tailspin from which it has never recovered. Rather than serving as a base upon which comprehensive care could be provided to dentally underserved children and youth, school dentistry virtually vanished as a significant component of American dentistry in the 1960s and 1970s. Just as numerous countries around the world were discovering school-based dental service as an important vehicle for upgrading children's oral health, communities in the United States that had long supported school dental programs were abandoning theirs in droves.

By the late 1970s, hardly anyone in the dental profession seemed to realize that hundreds of school dental clinics had once existed. School-based dental demonstration projects were launched as if they were wholly original ideas without significant precedent.[2] As one writer observed, school dentistry had become something of an abstraction; few treatment programs existed, and they were rarely discussed in the professional literature.[3]

Unfortunately, it is impossible to demonstrate empirically, save via city-by-city analysis, the process by which long-established school dental programs collapsed in the 1960s and 1970s. The ADA commissioned no further surveys on the subject, nor did scholars show interest in tracing the demise of treatment programs in individual cities. Our review of the dental and educational literature in the 1960s and 1970s turned up a plethora of commentary on new ideas in dental health pedagogy, but hardly a word on the abandonment of treatment services as a school responsibility. A half-century of school dentistry died without even a whimper.

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[1]Dunning, *Principles*, 1st ed., p. 419.

[2]See Max Schoen, "Financing Alternatives," in *School-Based Dental Delivery Systems*, pp. 79–83.

[3]Bagramian, "Combinations of School-Based Primary and Secondary Preventive Dental Programs," p. 275.

If the decline of school dentistry cannot be documented precisely, it can at least be explained partially. For one thing, the old-time school clinic had long since acquired a rather unsavory reputation within the profession as an ill-equipped, amateurish operation, run mainly by untalented beginning dentists or those on the verge of retirement, with no higher treatment goals than the relief of immediate pain by extraction of teeth or temporary fillings. No doubt this unsavory reputation gradually persuaded aspiring dentists to stay away from school clinics at the risk of harming their professional reputations, not to mention the risk of being accused of supporting "socialized dentistry."[4]

Dentists' reluctance to get involved in school programs was, of course, directly related to their lucrative and highly regarded position as family-oriented private practitioners. The postwar surge in dentistry continued unabated in the 1960s. Children of the baby boom, along with their parents, remained the mainstay of dentists' thriving practices. The 1960s also saw substantial growth in the scientific knowledge base and professional accord given pedodontics as a specialty of dentistry. To be sure, children's dentistry never became one of the profession's glamorous or prestigious specialties. Nonetheless, its professional legitimacy grew along with its economic rewards in the 1960s, as the teenagers of the baby-boom generation presented dentists with an endless supply of cavities to fill. Although the incomes of dentists remained below those of physicians, they were at last catching up. With the private, solo practice of dentistry in expensively outfitted, technologically state-of-the-art offices more securely grounded than ever before, and with pedodontics a more highly regarded specialty, the possibility of school dental practice for new graduates must have seemed a lowly prospect indeed.

Even among politically liberal, public-health-oriented dentists, the main directions for innovation in service delivery during the Great Society era generally bypassed the schools. The prime concerns of such dentists were two: first, expanding the number and capacity of dentists to meet rising public demand, and second, creating new means to reach dentally needy populations for whom private dental services were out of reach, either for financial reasons or because dentists did not serve their communities. To meet rising demand (beyond expanding the numbers of dental schools), the new buzz words in the field

[4]No doubt, the publication of Camille Lambert, Jr., and Howard Freeman, *The Clinic Habit*, New Haven: College and University Press, 1967, further dampened enthusiasm for clinic dentistry, even among public health advocates. Lambert and Freeman demonstrated that clinics' treatment of young children's teeth did nothing to improve the children's oral health during the adolescent years, and it undermined their parents' readiness to purchase private dental services after the children were too old to qualify for clinic care.

became "four-handed dentistry" and the "dental team." These meant the incorporation of one or several auxiliaries into each private practitioner's office to serve a larger number of patients in the same time the practitioner could previously serve one. Studies in the 1950s had revealed that dentists could easily triple their incomes by hiring a few auxiliaries. Not surprisingly, this means of serving the public good appealed to enterprising dentists, who rapidly incorporated auxiliaries—primarily lesser-trained and lower-paid dental assistants rather than hygienists—into their practices in the 1960s.

For the poorer populations who remained beyond dental care, two new approaches gained favor in the 1960s, neither of which proposed to utilize the schools to deliver services. One emphasized the need to "mainstream" the poor with unmet dental needs into private offices, rather than establishing separate government-funded dental clinics on their behalf. This approach resulted in 1965 in the incorporation of dental service into Medicaid. Despite irregular enactment and extraordinary bureaucratic hassles, Medicaid did dramatically expand the opportunity for poor people, especially children, to receive regular dental care. Of course, it also siphoned government funds into the hands of private practitioners rather than, as in earlier decades, into salaries for school or health department dentists, who once served similar socioeconomic populations. The second approach, while intended to draw in part on federal funds, proposed a very different arrangement for service delivery. Dentistry was to be included as part of new entities called "neighborhood health centers" which would bring treatment much closer to the areas in which poor people lived. The neighborhood health center idea was, however, largely abortive (apparently due, in part, to vigorous opposition from organized dentistry). It did not affect dental service delivery to poor children and adults nearly as much as Medicaid. In sum, the effort to make dental treatment more widely available in the 1960s and early 1970s largely sidestepped the school as a potential vehicle for service delivery.[5]

Although very much in the minority, a few prominent spokespersons for public health dentistry (e.g., James Dunning, John Ingle, Max Schoen, and Reuben Warren) argued strongly in the 1960s and 1970s for the school as a potentially excellent agency to deliver dental care to children. Even to this group, however, the school clinic of the 1910–1960 era remained but a dim memory, and a largely unsavory one

[5]This was even the case with the one major new government-funded dental service program which focused primarily on children in school, Project Headstart. While dental service was integral to the larger health service package of most Headstart programs, funding went mainly to private practitioners to serve preschoolers in their offices, rather than bringing the dentists to the preschool settings.

at that. Rather than building on older, indigenous models of clinic service, they proposed to start over by borrowing alternative models for school dentistry that had been developed in other countries. The program in New Zealand was the most frequently cited example.[6] In New Zealand, "dental nurses"—women with hygienist training who had also learned to prepare and fill simple cavities, with minimal dentist supervision—provided the bulk of dental care for elementary-grade children in school buildings throughout the country. Inasmuch as dental auxiliaries had already become major factors in the social organization of American dentistry, it would require relatively minor additional training, advocates of the New Zealand system argued, to prepare them as dental nurses and thereby transform the schools into vital components of children's dentistry.

The New Zealand example stirred sporadic interest among politicians and foundations, as well as among public-health-oriented dentists. But it ran into strong opposition from organized dentistry, which—beginning with a famous case in Massachusetts in the late 1940s—had successfully campaigned for stringent legislation in many states restricting what hygienists could and could not do.[7] Filling cavities—dentists' bread and butter—was emphatically proscribed for anyone but dentists everywhere in the United States.[8] In addition, the value of the New Zealand model itself began to be questioned by the mid-1970s. Despite the long-standing existence of extensive school dental service, adult New Zealanders, it was discovered, still generally had miserably diseased teeth. A further complication concerned the aspirations of American dental hygienists. It was not at all clear that they were interested in reconceiving their roles along the lines of the New Zealand dental nurse, as more-or-less independent, peripatetic private practitioners exclusively serving children in school settings. Besides earning higher pay in private practice, the advantages to hygienists of serving primarily adults in antiseptically clean, quiet, orderly, homelike dentists' offices were appealing. Finally, there was no reason to believe that the administrators of public schools,

[6]See James Dunning, "Deployment and Control of Dental Auxiliaries in New Zealand and Australia," *Journal of the American Dental Association*, Vol. 85, 1972, pp. 618–626; D. Redig, F. Dewhirst, G. Nevitt, and M. Snyder, "Delivery of Dental Services in New Zealand and California," *Journal of the Southern California Dental Association*, Vol. 41, 1973, pp. 318–350; Richard Logan, "Dental Care Delivery in New Zealand," in Ingle and Blair, *International Dental Care Delivery Systems*, pp. 23–39.

[7]See Ralph Lobene, *The Forsyth Experiment*, Cambridge, Massachusetts: Harvard University Press, 1979, pp. 19–20.

[8]Although financial considerations were of course involved, the dental profession—given the prevalence of dental quackery just a few decades earlier—was understandably protective of the high technical and professional standards it had recently achieved.

beleaguered as they were from all sides with school-based Great Society programs, were much enthused or ready to cooperate with yet another outsiders' attempt to use schools to achieve noneducational goals.

In sum, older traditions of school dentistry died quietly in the 1960s; even true believers in school-based dental delivery looked elsewhere for appropriate service models. To the extent that the dental profession showed much interest in the schools, it was to advance purely educational programs. Organized dentistry participated actively in the creation of these programs, which they then largely turned over to school health administrators to implement as they wished. The "Toothkeeper" program probably received greater publicity than any other. In retrospect, its attempt to teach regular classroom instructors to become effective dental health educators seems hardly different from dozens of similar programs in earlier decades. In any case, the Toothkeeper program proved to be ineffective.[9] Neither participating teachers nor students found the effort worthwhile, and the health of neither the children's teeth nor their gums was improved. While a few other educational experiments of the period succeeded in raising children's awareness of oral hygiene and proper diet, education alone proved powerless to affect their actual dental habits. When the experiments were over, the children reverted to their earlier dental practices, with predictable consequences for their oral health. Thus the dental health education programs of the 1960s and 1970s largely recapitulated the experiences of early generations of pedagogical enthusiasts. Nonetheless, both organized dentistry and professional educators remained committed to such programs as the most appropriate role for schools to play in meeting children's dental needs.

While organized dentistry continued to work closely with educators, its main hope for immediately curtailing the incidence of dental caries (a hope it shared with the public health community) lay in the popularization of fluorides. The profession's primary commitment was to community water fluoridation as the simplest and cheapest means to reduce tooth decay. Tremendous progress was made in the years following the Grand Rapids and Newburgh experiments. Community water fluoridation, which reached just over 1 million persons in 1950, reached over 30 million in 1959. In 1965, the movement won its biggest victory when New York City fluoridated its water supply, and the momentum, despite repeated setbacks in several major West Coast and

[9]Richard Graves, Donald McNeal, Don Haefner, and Beverly Ward, "A Comparison of the Effectiveness of the 'Toothkeeper' and a Traditional Dental Health Education Program," *Journal of Public Health Dentistry*, Vol. 35, Spring 1975, pp. 85–90; L. W. Smith, R. I. Evans, J. O. Suomi, and L. A. Friedman, "Teachers as Models in Programs for School Dental Health: An Evaluation of 'The Toothkeeper,'" ibid., pp. 75–80.

Southeastern cities (where natural fluoride levels were generally higher than on the East Coast), was decidedly forward. By the mid-1970s, nearly 7,500 communities serving somewhat less than half of the total U.S. population were drinking artificially fluoridated water.[10]

While there had always been local political opposition to the fluoridation of public drinking supplies, that opposition—represented best by the National Health Federation—began to become more vigorous, better organized, more politically astute, and more effective in the early 1970s. By mid-decade, the fairly consistent forward momentum of the fluoridation movement had slowed perceptibly. Although the total number of individuals receiving fluoridated water increased slightly by the early 1980s, there was clear evidence of backslide and declining public support.[11]

In retrospect, the very real possibility that community water fluoridation had reached political limits in the early 1970s may have cast the potential role schools might play in a new light to advocates of fluoridation. School-based fluoride programs had the advantage of sidestepping the increasingly hostile political climate. Now that operative dental treatment had been almost wholly removed from school settings, moreover, the public school itself presented a less threatening environment in which to advocate the introduction of new preventive measures. Whether such strategic thinking actually influenced decision-making within organized dentistry in the early 1970s is purely speculative. It may be that the profession viewed school-based fluoride treatments as a lesser evil than school-based treatment, and one that was impossible to resist politically as a profession. What is clear is that organized dentistry became outwardly more supportive than ever before of the school as a vehicle for fluoride dissemination. By the mid-1970s, organized dentistry had rediscovered the schools as integral to its professional mission.

Prior efforts to use the school to supply fluoride treatments had been sporadic and largely unorganized. The schools had generally not been looked upon as critical to the dissemination of fluorides to future generations. To be sure, there were some who viewed school water fluoridation as a savior for children in rural America. In such heavily rural states as North Carolina, Kentucky, Vermont, and Indiana, school water fluoridation programs grew substantially throughout the 1960s and early 1970s. Still, only 125,000 children were so served by

[10]In 1984, approximately 122 million Americans were drinking fluoridated water.

[11]See Robert Faine, "An Agenda for the Eighties: Community and School Fluoridation," *Journal of Public Health Dentistry*, Vol. 40, Summer 1980, pp. 258–267; and Ernest Newbrun, "Achievement of the Seventies: Community and School Fluoridation," ibid., pp. 234–247.

1975, a very small percentage of rural schoolchildren who might have benefited. Before the schools could become a key agency for disseminating fluorides, a different technology for their diffusion had to be developed that could be easily integrated into the customary classroom setting.

This technology became available by the early 1970s. Clinical trials in Scandinavia in the 1960s demonstrated that fluoride mouthrinses were effective in reducing tooth decay and that, unlike topical fluoride applications, they could be self-applied with only minimal professional supervision.[12] Rinse programs, it was believed, made educational material "stick" because of children's desire to link listening with *doing* something. Between 1970 and 1973, the staff of the National Caries Program of the National Institute of Dental Research (NIDR) launched a major publicity campaign to convince educators and dentists alike that school-based fluoride rinse programs represented the most cost-effective, school-based means currently available to prevent tooth decay. The NIDR worked closely with a private dental pharmaceutical company to develop a means to package fluoride rinses so that they could be easily integrated into normal classroom routines.[13] With the NIDR's imprimatur, the manufacturer launched its own massive marketing campaign aimed at school administrators and health officials. Directed at over 120,000 individuals, the campaign marked "the first systematic effort to reach school decisionmakers with information regarding fluoride rinses."[14]

After surveying dentists to make sure that they would not object, the NIDR in 1975 instituted 17 demonstration programs to determine how well communities would accept fluoride rinse programs and how much the programs would cost. A variety of other sponsors also instituted school-based rinse programs at around the same time. By 1980, nearly one-quarter of the nation's school districts were participating in fluoride rinse programs, which may have reached as many as 8 million children.[15] Initial public acceptance of these programs was generally high. While the level of permanent commitment by school officials to the program was suspect, and while implementation was far from perfect, the fluoride rinse programs of the 1970s reached far greater

[12]H. M. Bohannan, J. W. Stamm, R. C. Graves, and J. A. Disney, "Fluoride Mouthrinse Programs in Fluoridated Communities," unpublished paper.

[13]Jeanne Coombs, et al., "The Transfer of Preventive Health Technologies to Schools: A Focus on Implementation," *Social Science and Medicine*, Vol. 15A, 1981, p. 790.

[14]Ibid.

[15]Jacob Silversin, et al., "Adoption of Dental Preventive Measures in United States Schools," *Journal of Dental Research*, Vol. 59, December 1980, p. 2234.

numbers of children than the school dentistry programs of the 1910s to 1950s had ever reached.

Around the same time as the NIDR demonstration began, another ambitious demonstration project was initiated by the American Fund for Dental Health (AFDH), supported by The Robert Wood Johnson Foundation (RWJF) in cooperation with The Rand Corporation. Probably not since the heyday of the oral hygiene campaign had there been as much optimism regarding the school as the principal avenue through which to revolutionize American dental health. Located originally in over 200 schools in ten carefully selected communities, five fluoridated and five nonfluoridated, the RWJF demonstrations aimed to test two bold propositions that prominent dental researchers had recently advanced. First was the claim that there existed a variety of preventive procedures—especially fluoride mouthrinses and gels for the smooth surfaces of the teeth, and sealants for the chewing surfaces—that *in combination* held the potential to reduce dental caries by as much as 90 percent. Second was the proposition that preventive procedures could be delivered via school-based programs at far less cost and with greater efficiency than filling the teeth that would otherwise become decayed. The RWJF demonstrations, in the words of their sponsor, represented the "most carefully controlled and evaluated field test of preventive dental procedures ever mounted."[16]

The AFDH/Rand evaluation of the four-year field experiment produced a number of sobering, even startling, findings to those who had championed the virtues and cost-effectiveness of supplying combinations of preventive procedures via the schools.[17] First—not entirely unexpectedly, but never so well documented—the incidence of dental caries among the generation that came of school age in the late 1970s had already begun a precipitous nationwide decline before the study got under way, in nonfluoridated as well as fluoridated communities. While the precise causes were uncertain, the pervasiveness of fluorides in the food chain, as well as their widespread ingestion via community water supplies, tablets, home mouthrinses, and toothpastes, probably contributed to the decline. There was thus far less decay to prevent than those who had championed the preventive procedures had assumed.

Second, the AFDH/Rand evaluation challenged the positive results that had long been attributed to mouthrinse programs (including those of the recently completed NIDR demonstration programs).

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[16]The Robert Wood Johnson Foundation, *Special Report*, Number 2/1983, p. 3.

[17]Robert M. Bell, et al., *Treatment Effects in the National Preventive Dentistry Demonstration Program*, The Rand Corporation, R-3072-RWJ, February 1984.

Third, the AFDH/Rand study showed that the tendency of prior researchers to report program results in terms of the *percentages* of tooth surfaces saved, rather than the *numbers* of surfaces saved, exaggerated how much practical good preventive procedures actually accomplished.

Fourth, sealants rather than fluoride mouthrinses or tablets were found to be the most effective of the preventive procedures available for reducing decay. However, they were also fairly expensive to apply in school settings. Because the incidence of dental caries was much lower than anticipated, moreover, the actual numbers of tooth surfaces saved, even by sealants, was relatively small.

Fifth, the school turned out to be not nearly as efficient a site for delivering preventive procedures as had been assumed. Logistical and implementation problems were considerable, and indirect costs of fitting the program into the school's other activities were high. These problems had not been anticipated. Finally, community water fluoridation was demonstrated to be a simple, cheap, and effective means to reduce tooth decay. Particularly in fluoridated communities, but elsewhere too, school-based preventive procedures (with the exception of sealants), even in the most optimal combinations, were largely redundant. Furthermore, the AFDH/Rand study argued, they were more expensive to implement than was restorative care.

The AFDH/Rand study showed that the role of the schools in trying to upgrade American dental health in the near future was not at all clear. Most children's teeth had never been better. The vast amount of time and money devoted in the past to school dentistry and to dental health education programs had had little if anything to do with that improvement. Finally, there was no longer any reason to believe naively that it was cheap to provide preventive procedures via the schools.

To be sure, there was nothing in the AFDH/Rand evaluation that would preclude the possibility of using schools to deliver extensive treatment services to remaining groups of high-caries, low-income children in urban ghettos and rural areas. Moreover, if accurate predictive models could be developed, schools might be used as sites for identifying high-risk children and, perhaps, applying intensive preventive and periodic treatment procedures. Indeed, now that dental caries is no longer sufficiently prevalent to sustain the post-World War II boom in private dental practice, fundamental change in the social organization

of children's dentistry might conceivably be a more realistic possibility than ever.[18]

But that possibility, nonetheless, remains remote. With the school dental clinics of earlier years long gone, with organized dentistry still ideologically opposed to using schools for restorative treatment, with school administrators in a back-to-basics educational era unwilling to undertake new areas of social service delivery, and with caries declining as a significant dental health problem, it is difficult to foresee the source from which the impetus for fundamental change might come.

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[18]See Max Schoen, "Today's Dentist—The New Dinosaur," paper delivered to Dental Health Section, American Public Health Association, Annual Meeting, October 31, 1977; and James Dunning, "Harmony in Diversity," *Journal of Public Health Dentistry*, Vol. 42, Fall 1982, pp. 293–294.

# AFTERWORD

In this monograph, Schlossman, Brown, and Sedlak have carefully begun reconstructing an important and all-but-forgotten chapter in American dentistry. Such an exercise is valuable in and of itself, but this one is especially valuable for its timeliness. We are currently witnessing a revived interest in public school dental programs. Yet, as the authors point out, even among proponents of public health dentistry, "the school clinic of the 1910–1960 era [remains] a dim memory, and a largely unsavory one at that." We sorely need the opportunity that this history offers us to understand the actual genesis and nature of school dental programs, what they contributed to children's oral health, and why they flourished and then declined.

## The Profession's Response to School-Based Dental Programs

The past has important lessons to teach the profession as well as both the supporters and opponents of such programs. A large segment of the dental profession believes that school-based dental programs were primarily creatures of the Depression and represented forced retrogression, not progress. But as this history shows us, the reality was quite different. These programs began shortly after the turn of the century and made contributions that advanced the dental profession. For example, the programs contributed to progress in oral health education and dental preventive care and to the development of the dental hygiene profession.

Some of the school programs provided fairly comprehensive basic dental care for children at a time when they were unlikely to get it elsewhere. Before World War II, most parents did not place a very high priority on dental care for children, particularly care of the deciduous teeth. Consequently, dental schools did not provide adequate training in the treatment of children, and most dentists were reluctant to have them as patients. The rates for children's care were lower, children were troublesome patients, and the bills often went unpaid.

If there had been heavy public pressure for private children's care, dentists and dental schools might have responded differently. As it was, the public school programs took up some of the slack. Over the years, the school programs provided care that reflected current scientific thought and the state of the art. This caused their emphasis to swing from oral prophylaxis combined with disease therapy, to oral prophylaxis alone, to classroom education, and so on. But they

continued to provide care to this otherwise underserved group, and they did not always limit their treatment to the poor.

Ironically, the dental profession's general reluctance to treat children and the desire to develop its own status helped the school dental programs to flourish when prevailing political and economic forces caused a general decline in other public health care activities. Until the 1950s, the dental profession saw the school programs as serving its own best interests: School programs took care of children. They did not compete with the adult practices that most dentists preferred to develop. In hard times, they provided employment for new dental school graduates who had not yet built up their practices. In short, the programs provided no economic threat, and support for them presented the dental profession in a favorable light.

This convergence of the profession's self-interest and the public interest was indeed fortunate. However, school dental programs—as this monograph shows—provide an object lesson in the historical truism that the perceived value of any institution or program can change with a changing environment. After World War II, people became very aware of oral health, and parents began investing in dental care for their children. The dental profession flourished as never before, and the children of the baby boom contributed considerably to its prosperity. In this new environment, the profession began to see preventive, diagnostic, and treatment programs in the schools as a threat to private practice.

Predictably, the profession's encouragement and acceptance of such programs turned into opposition. That opposition has generally been presented as concern for the public interest: According to opponents, the programs do not offer adequate care. The dental profession's official stance in recent years has been to support oral health *education* programs in the schools. But it has strongly and steadily opposed treatment in the schools—even preventive care—especially treatment provided by dental nurses or hygienists.

One might ask why the dental profession would support a caries prevention program like fluoridation if it opposes school treatment programs because they decrease the demand for private care. Fluoridation, too, reduces the demand for care. The answer lies in the complex interaction of motives and circumstances. Support for fluoridation programs peaked when dentists could not cope with the rising demand for care. Moreover, *enlightened* self-interest would hardly permit the profession to oppose a proven preventive measure.

The profession's support for oral health *education* programs is similarly advantageous. They offer no competition; indeed, they may generate business for private practice. And supporting them enhances the profession's public image. Further, the history described here suggests

that the profession may have the implicit agreement of educators, who have their own reasons for preferring that school programs provide only education and not treatment.

Even though most of the programs did not directly involve teachers to any extent, they did remove students from the classroom, and they disrupted regular schedules for health-related activities. In addition, the schools are chronically short of funds, and they have salary, facility, and equipment problems to deal with. Even programs that "teach the teachers" contribute to the teachers' workload, and teachers cannot be expected to welcome more work and responsibility when they are already overworked and underpaid. Finally, the schools have been so burdened with extraeducational missions by Great Society programs that many administrators are less than enthusiastic about adding yet another one.

## Grounds of the Current Debate

Proponents of school preventive or treatment programs must realize that it may not be appropriate to give educational institutions the added responsibility for health care activities. However, those who support education programs as the only appropriate role for the public schools bear the burden of proof that such programs are effective. So far, they haven't made a case. Further, the National Preventive Dentistry Demonstration program sponsored by the Robert Wood Johnson Foundation is only the latest in a series of studies that have found little, if any, effect of education on oral health.

Even if it could be demonstrated that dental education programs do have some positive effect on children's health or habits, that would not constitute an argument *against* programs that offer preventive care or therapy. And there are compelling reasons for considering the restoration of such programs—among them issues of social equity. Since the demise of treatment programs in the schools, poor children have become even more disadvantaged. Great Society programs such as Medicaid, Headstart, and Neighborhood Health Centers have a very spotty record in bringing the poor into the "mainstream" of dental health care.

Consequently, people have begun to reconsider the possible effects of school treatment programs. Such programs could make it possible to apply health measures, particularly preventive measures, to virtually every schoolchild in the country. The argument for using the school setting is especially compelling in terms of specific socioeconomic groups among which the effects of dental disease are particularly severe.

### Historical Lessons for Both Sides

As I have been suggesting, and the monograph makes clear, the new proponents of school treatment programs face a formidable challenge in dealing with the dental profession's official attitude and opposition. However, I believe that the past provides lessons for both sides. The most important lesson is that *multiple models of children's dental care will probably best serve a varied public.* Insistence on only one model is reductionist and unnecessarily polarizing, no matter where it originates.

The dental profession might consider how its attitudes and perceptions have changed about certain issues, for example, about dental auxiliaries. Dentists have tended to be less critical of auxiliaries when their practices are full and busy. This makes rather suspect the dentists' concern about the effects on the public's oral health of dental nurses and hygienists being allowed to practice independently. In today's less expansive climate for dentists, the hygienist profession probably would never have developed. Yet how many dentists would now opt to do without these dental professionals? Without them, periodontal problems would no doubt be even more out of control than they are now.

Changes in the profession's view of "what's good for the public" can also be seen in the brief history of third-party payment. Thirty years ago, dentists were outraged at the idea of a fiscal intermediary in their financial arrangements with patients. They considered it radical, possibly unethical, and even destructive to the profession. Today, most dentists would not think of going back to the old ways. Granted, they have numerous complaints. However, most recognize that by making more money available and covering a much broader segment of the population, third-party carriers have enabled dentists to provide more dental care of a more varied nature. There are fewer unmet needs and less edentulism, which may, in part, reflect this change.

Proponents of school treatment programs also have a lesson to learn from the past: They must consider changing needs, changes in dental care delivery, and changes in the political context when they make program recommendations. As the monograph points out, they have often vaunted the school-based treatment developed in New Zealand as an appropriate model for U.S. school programs. In New Zealand, dental nurses provide most of the dental care for children in the elementary grades, at school sites.

For about the first 25 years after World War II, circumstances in this country were such that school programs based on the New Zealand model might well have been possible, and demonstration programs would have been worthwhile. But now, programs using dental nurses

would be politically unacceptable, given the declining caries rate, the rapidly growing number of dentists, and third-party payment programs. Those of us who are philosophically in favor of a broad public commitment to health care must constantly test how well specific proposals "fit" the reality of changing circumstances.

Another lesson for both sides is that we need less rhetoric and more rigorous research on the issues. By calling for and relying on such research in their arguments, both sides could make their expressed concern for the public interest more convincing.

### Toward a Useful Research Agenda

As I noted above, the dental profession must be able to prove that oral education programs are effective if it continues to insist that education is the only function school dental programs should perform. Research to date suggests that education has affected oral health very little. Nevertheless, something has altered the public's concern. There is more home and professional dental care. About half the population uses fluoridated water, and almost all toothpaste contains fluoride. There have been numerous studies of water fluoridation, but what is needed is a systematic historical analysis of the change in attitudes toward dental care and preservation of teeth.

Just as the profession must provide evidence that educational programs are effective, proponents of treatment programs must do the same for those programs. However, it is absolutely essential that this research go beyond the current, narrow "scientific" approach to public policy. The National Preventive Dentistry Demonstration program, mentioned above, illustrates the limitations of using only cost-benefit analysis to evaluate a preventive program.

That study established some important facts about the heartening decline in dental disease among children and the relative costs of prevention and treatment. It tested the claim that school-taught preventive measures were far less costly and far more efficient than filling the teeth that would decay without such measures. It found that sealants reduced decay far better than fluoride mouthrinses or tablets did. However, it also found that applying the sealant would be more than twice as expensive as treating the very few cavities that children were likely to develop. In short, school preventive programs would not be cost effective.

I believe that limiting analysis to this finding fails to put this issue in proper perspective. The current state of the art of evaluating prevention programs leaves a lot of questions unanswered. In the first place, for some children, particularly those of lower socioeconomic groups, caries result in pain, infection, and possible tooth loss. The

eventual consequences of early tooth loss are not clearly understood, but such loss probably causes considerable damage to the masticatory apparatus. It may also hasten additional tooth loss and make repairs more costly and less satisfactory than they would otherwise have been.

Does damage to health and well-being always have to be measured solely in economic terms? Of course not. But even in those terms, we would need to know how the costs of preventive measures compare with the costs of replacing teeth and how long restorations last. Any practicing dentist knows that permanent restorations are anything but permanent. However, we don't know how long restorations last, nor do we understand the exact chain of events as each restoration is replaced by a new and invariably larger one. We also don't know the indirect costs of loss of education and loss of work time. These are researchable issues, albeit difficult ones, that must be addressed to determine the costs of prevention relative to restoration or no treatment at all.

One thing is clear from the extent to which children are now treated in private practice: Dentistry for children has stood the market test. A large percentage of children see a dentist regularly and receive radiographs, examinations, prophylaxis, and topical fluoride, at considerable expense. Thus, it seems only reasonable that research should clarify the debate over school programs by looking at the relative costs of school and private treatment and the relative effectiveness of treating children in each setting.

At the very least, research should consider the following questions:

1. What would be the relative cost-benefits for equivalent therapies in different settings?
2. Is a clinical program likely to be more effective in a school or in a private setting?
3. Would having prevention and treatment of disease take place at the same location decrease overlap and duplication?

Opposition to school-based programs will probably include claims about their "great" cost to the public. (Opponents will certainly be inclined to cite findings such as the relatively high cost of prevention.) But what of the relative costs for private care, including preventive measures? The preventive dentistry evaluation indicated that sealants applied in school programs cost $23 per year per child—far less than their cost in private practice.

Considering both private and public expense, research should also examine the cost-benefit ratios for various combinations of treatments. Some might argue that this is more relevant for public programs, which have a greater responsibility to use funds wisely. But it seems only

reasonable that individuals and groups should also have the information that enables them to base decisions, in part, on economic effects.

Research is also needed on (1) the consistency and efficacy of treatments and (2) the degree to which susceptible children receive therapy. There is some evidence that public-school-based programs may be more effective on both counts. For example, in Saskatchewan, private practice showed greater variation than public programs in technique and less penetration of the target population. (The Saskatchewan program is discussed below.)

Finally, research should address the question of overlap and duplication if prevention and treatment are provided in different settings. The preventive dentistry demonstration is an example of the potential problems. Children who went to the dentist during the study undoubtedly experienced much duplication of effort. This is not because of faults in the design demonstration, however. It is simply that broader cost-benefit studies are needed that combine treatment and prevention. Even though caries have decreased, there are enough unprevented and untreated caries to enable a more comprehensive demonstration.

### Modern Experiments

Several modern experiments suggest that school-based treatment programs may be quite effective (despite the profession's concern that they do not offer adequate care) and quite acceptable to both parents and communities (despite the profession's conviction that public service programs raise the specter of socialism). Two such experiments were part of a pioneering series of school-based programs conducted by the United States Public Health Service (USPHS); another program was conducted in Saskatchewan.

In the 1950s, the USPHS conducted demonstrations of school-based programs in two communities, one with fluoridated water (Gainesville, Florida) and the other with nonfluoridated water and an exceptionally high caries rate (Woonsocket, Rhode Island). These programs provided comprehensive dental care administered by dentists using "four-handed" techniques and multiple chairs, located in the schools. About 85 percent of the public school children participated in four rounds of treatment. Most untreated caries were eliminated, and extraction of permanent teeth decreased almost to zero. Over the five years of the demonstration, use of resources and, consequently, cost also decreased steadily. A follow-up study five years after the demonstration found that much of the benefit had been lost in the nonfluoridated community.

In Saskatchewan, a school-based dental program has had great preventive and therapeutic success. The overwhelming majority of children have been involved, and the incidence of caries has declined. Relatively few untreated carious teeth remain and almost no teeth are extracted. This program uses dental therapists instead of dentists, but the results are similar to those in the USPHS demonstrations.

The U.S. experiments clearly demonstrate the value of efficient use of personnel and facilities, as well as the value of regular periodic care. Despite the success of these experiments, the USPHS approach was not incorporated into existing school-based programs, nor was it used in new programs. The lessons of the Saskatchewan experiment also seem to be "coming unlearned." In the past few years, older children have been channeled into private practice to "aid their transition into adult dental care," and early data show reduced use rates for them. In all three communities, the economic, political, and professional pressures that explain the varying degrees of disregard for evidence that school-based treatment programs can be highly effective and economical should be addressed.

## Closing Remarks

As my comments indicate, this historical monograph has made me rethink some old ideas and generate some new ones. By placing the current debate over school-based dental programs in its larger historical context, the authors have corrected many misconceptions about such programs. Equally important, they have shown that a great variety of delivery modes have been acceptable to our country. None of these has "destroyed" dentistry, despite the alarums of their opponents. In fact, most have made positive contributions. Perhaps most important, this history may make health professionals reconsider the effects of self-interest on their attitudes toward various models of care. This point is particularly important in terms of professional responsibility and social equity. If effective prevention and treatment programs are not instituted, at least in communities and/or schools where many children do not receive dental care, there may be consequences far worse than a slight increase in the incidence of carious teeth. If Beverly Hills has no program, the costs simply shift to the private sector. But if Watts has no program, the costs translate into children's pain and the loss of teeth.

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